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STEEL

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FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

What Iron Imports Cost

To the Editor:

With the formulation of a reciprocal trade agreement with the United Kingdom now under way, it might be a good idea to review again the serious effects of pig iron imports on our unemployment problem.

During the past year low-paid foreign labor, equivalent to *2,233,940 United States man-hours, was imported, largely along the Atlantic seaboard, in the form of pig iron. In other words, 1116 willing and worthy American workmen were deprived of a full year's work, 40 hours per week for 50 weeks. What it cost the government to support these men and their families will never be known but the gross duty on this imported cheap labor (pig iron, if you insist) only amounted to between 5 and 6 cents per man-hour.

Assuming that the buyers purchased this foreign product at an average saving of $1 per ton, then we have $111,697 as an invoice saving to the domestic user. If to this figure, we add the government's gross duty of $125,659, the total will be $237,356. Having "saved" this amount, suppose we use it for relief purposes.

Let's divide this figure by the 1116 men who were deprived of work because of these importations. The result is exactly $212.68 for each. The balance necessary to support these workers and their families for a whole year must necessarily come out of the taxpayers. This amount, whatever it may be, represents direct out-of-pocket loss, to which must be added the tremendous toll on American business represented by depreciation on idle properties. In fact every dollar saved by domestic users of foreign iron is one dollar that the pig iron industry must swallow because of enforced idleness of corresponding capacity to produce and such loss must sooner or later show as a cost factor and be reflected in domestic prices. Hence, the foundry industry not only makes up the pig iron industry's loss through idleness but carries its share of "relief" taxation as well.

We don't save money on imported pig iron labor because we pay twice. We pay in taxation to support 1116 men *and their families* and the money which otherwise would have supported them we send abroad, to support three or four times as many foreign workmen *and their families.*

In these days, when the talk is largely in billions, it is perhaps picayunish to mention smaller figures, but this imported labor in the form of pig iron at the present American hourly rates would have represented a million dollar payroll.

If, by using the same formula, we reduce all other unnecessary imports to the basis of man-hours lost, then the reason for our swollen unemployment rolls becomes quite evident.

It is interesting to note that since the rush hour of demand is past, England has lost no time in moving to restore her high duty on pig iron.

*Eastern merchant furnaces, bearing the brunt of this competition, figure 20 man-hours per ton of pig iron. This goes back to the ore in the ground, mining and preparation of coal, transportation, conversion, etc.

Eastern Merchant
Pig Iron Producer

Picture of World Steel

To the Editor:

The picture of world developments in steelmaking as presented in STEEL is of the greatest interest. Germany is turning to its low-grade ores to add to its domestic production, an American engineer, H. A. Brassert, being placed in charge of design and construction. (STEEL, Aug. 9, 1937, p. 18.) Great Britain is building a plant on a field of lean ore, Arthur G. McKee & Co., Cleveland, being in charge. (STEEL, Feb. 28, p. 48.) Italy has formed a company to make use of the iron content of its iron pyrites deposits, to free it from dependence on scrap from outside countries. (STEEL, March 14, p. 31.)

A valuable contribution to the history of steelmaking was contained in two recent articles on the Tata Iron & Steel Co. in India, in which two American engineers, Charles P. Perin and J. L. Keenan, had leading roles in developing a large producing works. (STEEL, Jan. 31, p. 23 and Feb. 14, p. 27.)

American skill would seem preeminent in steelmaking, called on by all nations when need arises. Incidentally, the United States may well be congratulated on its tremendous reserve of iron ore of high content, which pushes into the far future necessity for developing ores of less iron content.

ENGINEER

Pittsburgh.

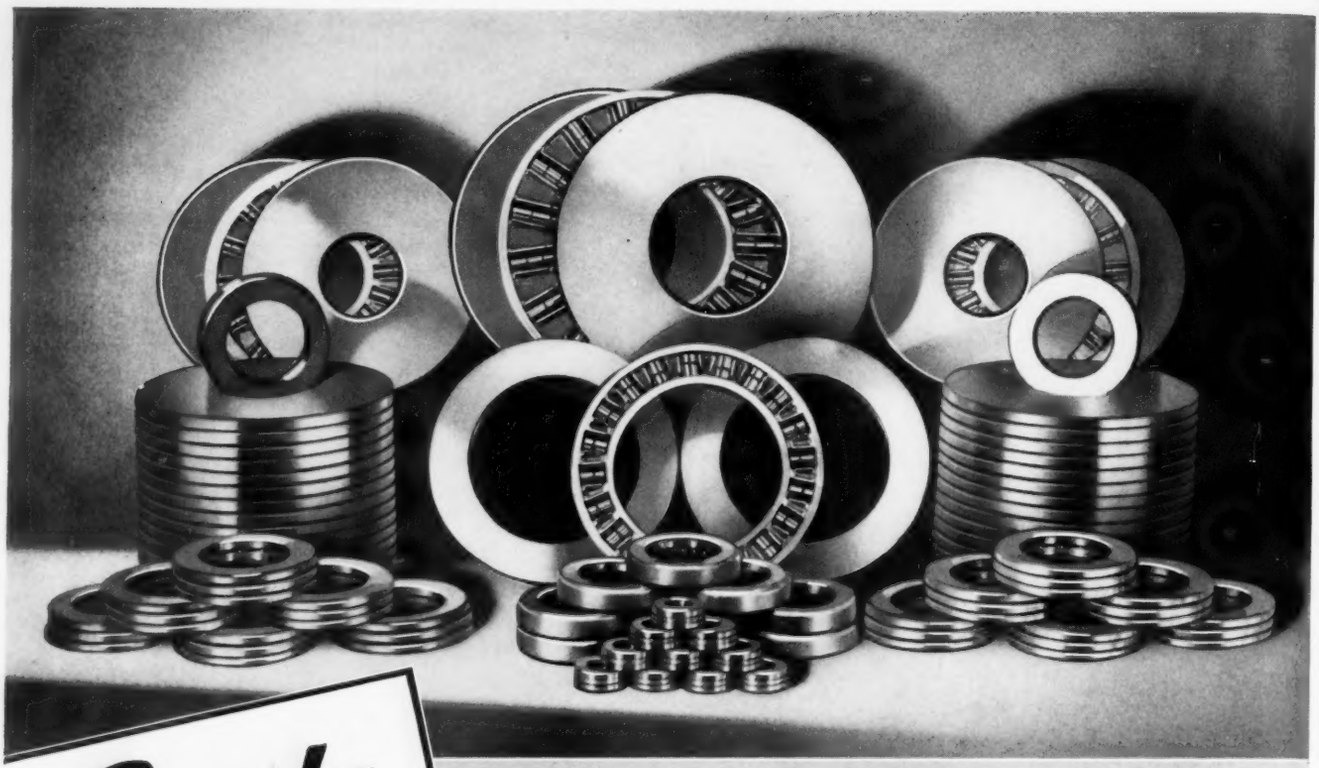
New Code Aids Steel

To the Editor:

The effect the new building code in New York may have upon the use of steel is considerable. The 1938 code contains three innovations as compared with the old code. (STEEL, Feb 28, p. 19.)

It permits the use of steel joists as secondary members for floor fillers in structures 100 feet or less in height, where the required live load is 60 pounds or less per square foot. These steel joists used in connection with less strict fireproofing requirements constitute what is known as

(*Please turn to Page* 87)



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STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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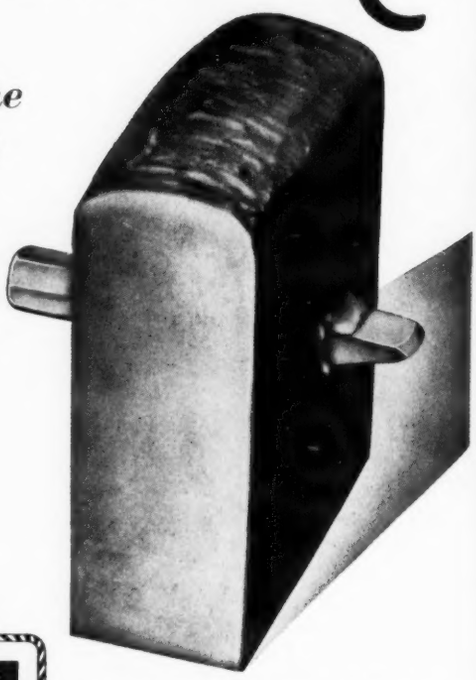
PRODUCTION · PROCESSING · DISTRIBUTION · USE

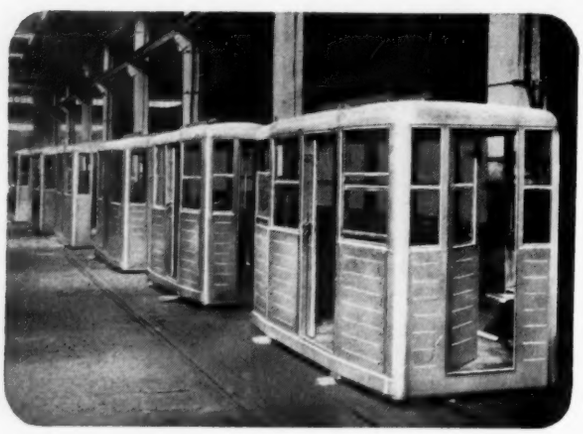
SIMPLE ARITHMETIC

...proves the ECONOMY of the NICKEL ALLOY STEELS



15 x 1 = 15 times Longer life

Multiply the life of a tool and you subtract from the ultimate cost. And a case where tool life was increased 15 times by the simple expedient of Nickel alloy steel in one large industrial plant is indeed a case in point. The chisel driven cold through this loaf-like block of mild steel is simply a dramatic demonstration of its capabilities, but the part of the story that is most interesting to the treasury's watchdog is the fact that it showed a service life 1400% greater than the plain carbon steel type formerly used. The increased strength, toughness, wear-resistance, and shock-resistance obtained with the Nickel alloy steels quickly compensate for the slightly higher initial cost.



100% – 56% = 44% of former weight

Dead weight is a wastrel. It squanders power in many an application, subjects machinery to unnecessary stress, wear and fatigue. But Piaggio & Co. of Genoa, Italy, solved the problem of useless weight in the same way that scores of railroads are now doing. They used stainless steel for these aerial railway cars destined for use in the Italian Alps. Fabricated under license of the Edward G. Budd Manufacturing Co. of Philadelphia, these cars when completed weighed 56% less than the type formerly used. The composition employed was the popular "18-8" chromium-Nickel steel which possesses an unusually high strength-weight ratio.

16 – 15 = 1 Survivor

Plow discs of the type pictured here take a terrific beating from shocks and abrasion. A prominent manufacturer, Ingersoll Steel and Disc Division of Borg-Warner Corp., recently developed a steel for this purpose, having all of the requisite properties for long service life against breakage. Composition is known as "Super-Alloy" and contains from 1 to 1½% Nickel, a fact that explains its unusual endurance. Demonstration of its superiority was recently made when a harrow disc plow came to this manufacturer's attention with 15 of its 16 discs broken. Analysis brought to light that the 1 survivor was made of "Super-Alloy", the composition containing Nickel.

We invite consultation on the use of the Nickel alloy steels in your equipment.

NICKEL ALLOY STEELS

THE INTERNATIONAL NICKEL COMPANY, INC., NEW YORK, N. Y.

As the Editor Views the News

■ NEWS of the past week was mildly encouraging to the metal producing and metalworking industries. STEEL's survey of agricultural prospects (p. 17) indicates that the farmer's income in the first half of 1938 will not be much under the level of a year ago. Sales of agricultural implements should not be much under last year's volume. New expansion programs announced include outlays of $1,250,000 (p. 20) by Westinghouse Electric & Mfg. Co., and $500,000 (p. 23) by Carboloy Co. Inc. The rate of steel ingot production (p. 23) rose 2 points to 32 per cent. Further strength is reflected (p. 67) in the scrap iron and steel market. Several substantial rail tonnages have been placed during the past week and considerable steel tonnage for shipbuilding is moving.

• • •

Easier Tax In Senate

The senate finance committee began its hearings last week (p. 31) on the proposed new revenue bill recently submitted by the house and there were immediate indications that industry can expect much better treatment from the senate than from the house. "While the house retained only the skeleton of the undistributed profits tax," said Senator Harrison, "the remains will haunt business and its complete removal and return to a sufficient flat corporation tax is preferable" . . . Hearings on the proposed tariff agreement with the United Kingdom (p. 19) brought out numerous protests against tariff reductions . . . Essential place of the warehouse in the distribution of finished steel products is further reflected by 1937 warehouse sales of 4,342,000 tons, an all-time high.

• • •

Little From Austria

Germany's steel ingot production in 1937 was 19,538,000 tons compared with 20,741,700 tons for England and France combined. Due to the huge demands in those countries last year these figures may be regarded as indicative of practical capacity. Acquisition of Austria (p. 20) adds only about 625,000 tons to Germany's capacity, leaving a continued large deficiency. Germany's requirements are estimated at 26,000,000 tons . . . From Detroit comes word (p. 27) that popularity of straightline eight engines appears to be on the wane. A survey shows 6-cylinder cars comprised 63.6 per cent and 8-cylinder models 34.1 per cent of the entire total for 1937. Bulk of the 8-cylinder sales comprised V-8's whose popularity seems to be increasing.

• • •

Mill Giant "Unveiled"

New giant of the steel industry, the 98-inch continuous mill at Cleveland, was unveiled to the press last Tuesday. The hot mill (p. 36) has maximum delivery speed of 2121 feet per minute and rolls from 30 to 94 inches wide and from 18-gage strip to ½-inch plate. Nominal rated capacity is 840,000 gross tons a year . . . Efficient facilities and methods for receiving, stowing, handling and delivering freight offer important savings to manufacturers and distributors. Last year's "perfect shipping" campaign (p. 47) is to be repeated this year . . . The salt bath (p. 50) is gaining new applications in the field of heat treating. Salts now available cover the entire range of neutral hardening, annealing, normalizing, drawing, carburizing and high-speed steel treatment.

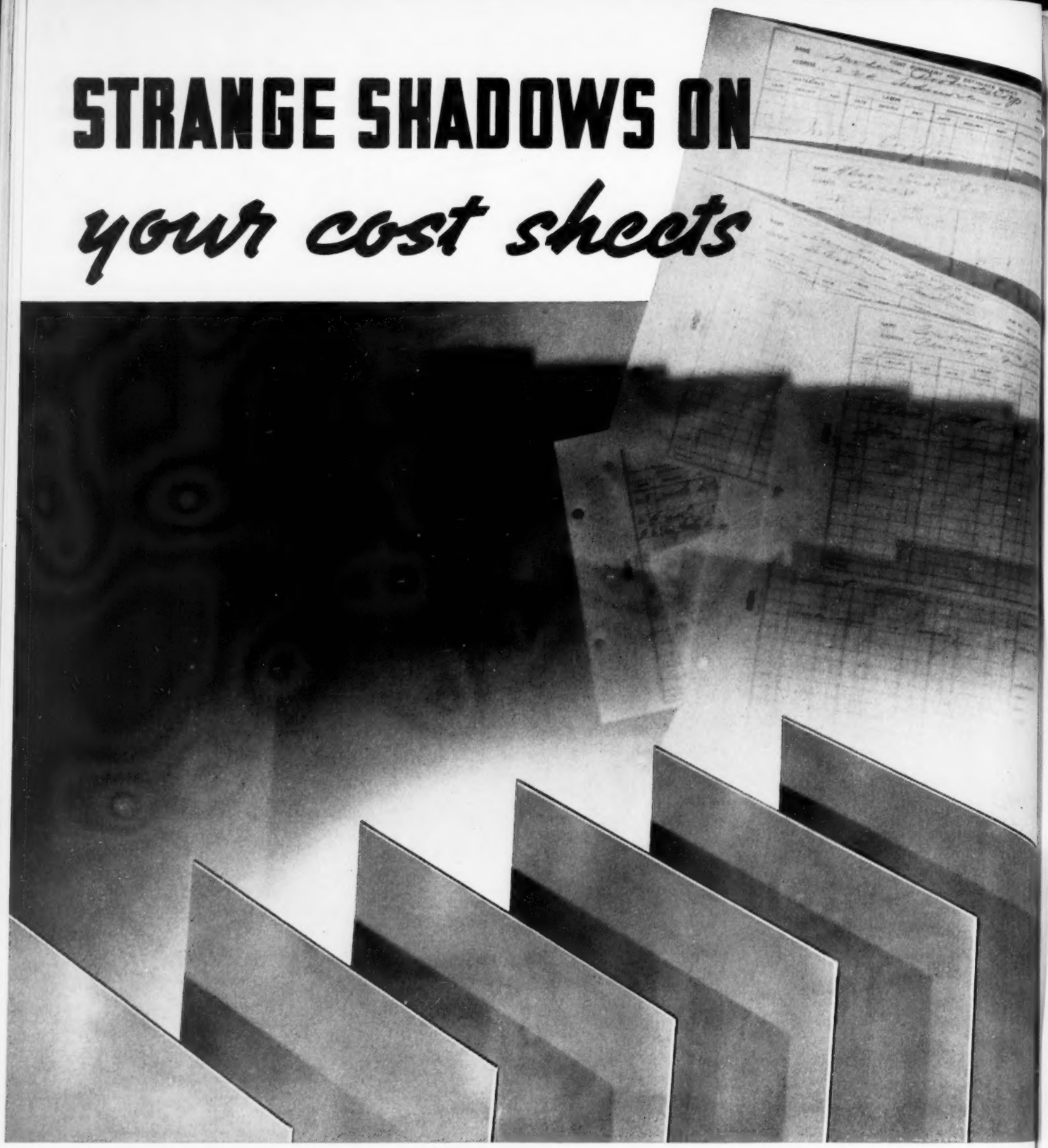
• • •

Many New Standards

Many new specifications and tests, and many changes in existing standards and procedures have been approved by the American Society for Testing Materials. These changes (p. 56) were made in more than 165 committee meetings attended by a new high of 662 . . . In the early years when emphasis was placed on safety guards (p. 54) the decrease in accidents was small. When attention was focused on the factor of human behavior results were immediate. Today's safety campaigns depend for success largely on enlisting the enthusiastic support and co-operation of the workmen concerned . . . The old-fashioned kitchen range has gone modern. A new coal and wood burning stove (p. 65), of streamline design, is made of sheet steel with porcelain enamel inside and out.

E. L. Shaner

STRANGE SHADOWS ON *your cost sheets*



LOOK for them. What caused this item of expense or that delay in time?

Plain steel can cast some strange shadows on cost sheets when all factors affecting its use are not properly taken into consideration.

Don't think, for example, that because your specifications call merely for flat bars, plates or sheets that opportunities for worthwhile economies do not exist.

That's where they're often found when looked for by the practiced eye of the specialist. Consult an Inland engineer or metallurgist on your very next steel order. If he can save money or time, the profit is yours. In any event, you risk no expense or obligation in making use of his efforts.

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SHEETS STRIP TIN PLATE BARS RAILS
TRACK ACCESSORIES PLATES FLOOR PLATES
STRUCTURALS PILING REINFORCING BARS

Well Sustained Farm Income Points To Good Implement, Materials Buying

■ THE FARMER has not yet reached Easy street, but at the moment he is closer to that thorofare than are most of his city cousins.

From the standpoint of income, agriculture is near levels of a year ago, while 1937 business volume is almost a total stranger to the majority of manufacturing industries.

One important exception to this latter situation is the farm equipment industry. It is only natural that activity of implement and tractor builders should reflect conditions in agriculture, and from present indications production of farm equipment in coming months will follow closely the trend in farmers' earnings.

Farm income has been slower to decline during the present business slump than has income of industrial workers, a reversal of the trend prevailing at the start of the 1929 depression.

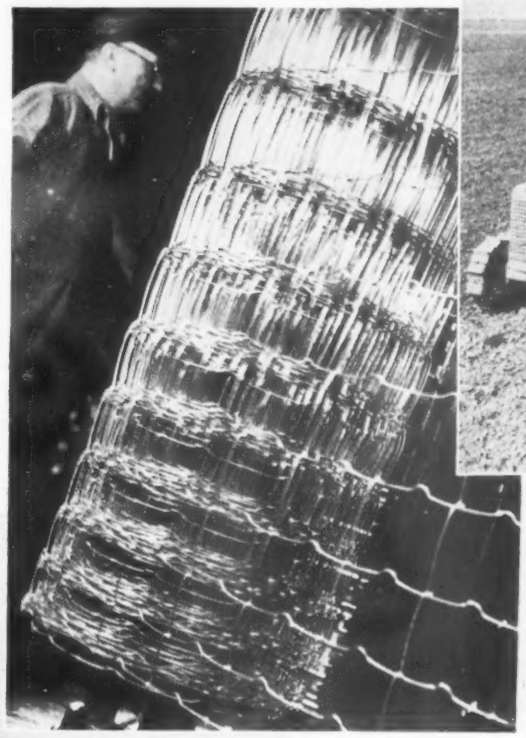
From August to December last year industrial workers' income dropped 20 per cent, against a decline of 15 per cent for farm income. In 1929-30 farm income slipped 28 per cent while factory employes' earnings were declining 20 per cent.

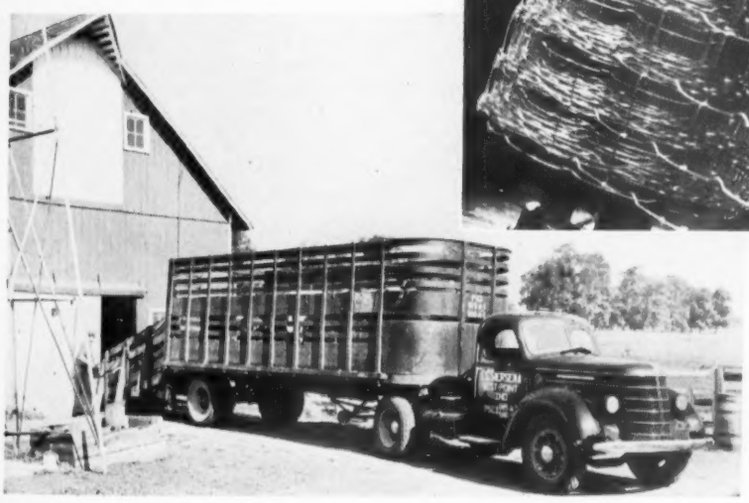
Estimates made by the department of agriculture indicate that income from sales of farm products the first half of 1938 will total about $3,000,000,000 compared with $3,500,000,000 last year. In addition, it is expected that soil conservation payments this half will be larger than they were a year ago.

It is hazardous to make predictions concerning agriculture over a long period, but the federal department believes total 1938 cash income will be "somewhat lower" than the $8,521,000,000 return of 1937. The latter, incidentally, was the largest since 1929 and from the standpoint of real buying power compared favorably with that year's income.

The future trend in prices of farm products will have considerable influence on agricultural earnings. Prices currently are off substantially from peak levels of the past two years, and the ratio of prices received by farmers to the prices paid for commodities bought has declined about 20 per cent since a year ago. This condition has been offset by the larger supply of farm products on hand compared with last year, however, hence the decrease in buying power of farm income is estimated at less than 10 per cent.

Assuming that the farmer's reward for his efforts this year will be only moderately, rather than drastically, below that of 1937, it is safe to predict that his purchases of equipment will be reasonably well maintained. It has been ob-





■ Small tractor of the type rapidly coming into use on American farms. This tractor, with body clearance of 18 to 20 inches, is pulling disc, culti-packer and harrow. Left, reeling in farm fencing at the factory. Below, an all-steel truck body for transporting livestock. Farmers now make 55 per cent of their livestock shipments to market by motor truck; twenty years ago the proportion was only 2 per cent, government figures. Photos, Cleveland Tractor Co., American Steel & Wire Co., and International Harvester Co.

served in the past that the farmer regulates his buying more by his income than by changes in general business conditions. For example, 1930 was a relatively good year in farm equipment sales despite the fact that depression rapidly was gathering momentum at that time.

Implement sales in a given year are affected to a large extent by income of the previous year as well as by that of the current period. Cash income was steady from 1924 through 1929 at around ten billion dollars annually.

In 1930 there was a drop of 19 per cent and while farmers curtailed their equipment purchases that year 17 per cent, buying was larger than the average of the four years 1925-1928. This 17 per cent drop in equipment sales in 1930 compares with a decrease of nearly 28 per cent in steel ingot production that year, while output of automobiles declined more than 37 per cent.

Buying Lags Behind Income

A similar trend was apparent after the turn of the depression. Cash farm income rose more than 18 per cent in 1933, but effects of the poor earnings of 1931 and 1932 influenced equipment sales to such an extent that there was practically no recovery until 1934. In the latter year there was a 65 per cent gain in equipment buying with a rise of only 23 per cent in cash income.

This circumstance is an important reason why implement and tractor builders look for reasonably good sales this year even though there seems likely to be a falling off in agriculture's cash return. Should the general industrial inactivity now prevailing become intensified or unduly prolonged, the effect on demand for farm commodities is self-evident.

Weather conditions have been fairly good lately, though sections of the wheat country are deficient in sub-soil moisture and are dependent upon frequent rains to obtain good growing conditions. The outlook in the Great Plains area has been improved the past few weeks by heavy snow and rain.

While the farm equipment industry has curtailed its operations somewhat in recent months, production still is well above the average of all metalworking plants, and steel requirements are substantial when measured against the reduced flow of business coming from railroads, automotive companies and other normally large consumers.

The precipitate letdown in industrial activity late last year had much less effect on farm equipment operations. December payrolls of implement plants were 43 per cent higher than the year before, while combined payrolls of all manufacturing industries were 15 per cent lower than in December, 1936.

Current output of implements and tractors is about 20 per cent under the 1937 peak, but it must be remembered that last year was a record-breaker. Compared with activity a year ago this time, operations are down slightly more than 10 per cent, it is estimated. Export business has continued active, sales in January—the last month reported—totaling $6,018,037, compared with $4,018,292 in the like 1937 month.

While production schedules, projected last fall when the industry prepared its estimate of probable business during early months of 1938, have been pared, inventories of finished machines available for the spring trade are expected to be larger than a year ago.

Inconvenience was experienced at times last year by the inability of the industry to fill orders promptly, a situation that prompted some companies to enlarge their capacity to avoid a repetition of that condition in 1938.

After setting a record in tractor production in 1937 some decrease is looked for by builders this year, due to the fact that sales of the industrial type are being affected by the letdown in general business. Demand for farm tractors is counted on to make a reasonably good comparison with the 1937 volume.

Much enthusiasm over the outlook for farm equipment sales resulted from the success of the thirty-fifth annual Western Tractor and Power Farm Equipment show, held recently in Wichita, Kans. This drew a record crowd, exceeding the estimated 125,000 attendance at the 1937 display, while the volume of actual business done was the largest ever to be obtained from such an exposition.

Small Tractors Well-Received

Possibly typical of what may be expected over the country as a whole was the interest shown at the Wichita show in new combine and tractor models designed for use on smaller farms. The small power unit has enjoyed a rapidly expanding market among farms of limited acreage as well as finding application as an auxiliary tractor for lighter operations around the larger properties. Dam listers, introduced more than a year ago to aid moisture conservation in areas of light rainfall, also have attracted interest. These attachments are designed to create small dams in furrows to retain water rather than permit it to run off the field.

Equipment sales the past two years have been stimulated not only by the better income of farmers but also by the substantial volume of buying that was postponed during the depression. While considerable of this arrearage has been cleared up, there remains a large amount of deferred buying that will help to maintain business this year.

The extent of this potential market can be ascertained only roughly, but a comparison of farm equipment purchases before and since 1929 provides some interesting figures. In the five years 1925-1929 domestic sales of farm equipment averaged slightly under $400,000,000 annually. The next five years sales were cut almost one-half. Assuming that pre-depression purchases were at a rate necessary to maintain equipment in normal condition, the deficiency in buying accumulated during the five years amounted to $920,000,000.

Large Theoretical Backlog

In 1935, 1936 and 1937 sales averaged about $25,000,000 larger than the pre-depression rate but after deducting this total there still remains a theoretical deferred maintenance of $850,000,000.

This figure probably is too high, if it is taken to mean the sum necessary to restore farm equipment to normal condition. However, it does indicate that the few years of business recovery have been insufficient to wipe out the effects of the depression and that expanding industrial activity, rather than renewed depression, should be the logical course for some time to come.

Railway Appliances Show Attracts 10,000

■ Annual exposition of the National Railway Appliances association, held last week at the International Amphitheatre, Chicago, attracted more than 10,000 visitors. The exposition coincided with the American Railway Engineering association convention at the Palmer House, Chicago.

Ninety-four exhibitors were represented by displays of materials and equipment used in constructing and maintaining tracks, structures and other railroad properties. Equipment shown ranged from rail-highway trucks and tractors to hacksaw blades.

Exhibit was directed by E. D. Cowlin, Eaton Mfg. Co., Reliance Spring Washer division, Massillon, O., president of the N. R. A. A., and C. H. White, Industrial Brownhoist Corp., Bay City, Mich., secretary.

Technical sessions covering materials employed in building and maintaining tracks and other facilities comprised the program of the American Railway Engineering association.

Industries Present Case Against Tariff Cuts—Mainly in Briefs

■ NOT more than 100 of the 500 witnesses summoned to represent American industries appeared before the Committee on Reciprocity Information in Washington last week when hearings began on the proposed trade agreement with the United Kingdom.

Considering the written protests against tariff reductions which have been pouring into Washington recently committee members considered the personal attendance rather small.

Hearings will be continued this week, and possibly more will be present, issues of vital concern to many industries being up for consideration.

W. E. Umstattd, president, Timken Roller Bearing Co., stated that his company employs 3500 steel workers and 6100 bearing makers under normal conditions. He urged the committee not to reduce the import duty on balls and rollers, calling attention to the fact that if this is done in the case of Great Britain it also will apply to imports from all other countries enjoying the most favored nation clause.

He said that "large manufacturing plants fully equipped with modern machinery to make balls and rollers are established in Italy, France, Germany, Sweden and England. We feel that countries other than England will benefit to a great extent from a reduction of the duty rate on balls and rollers."

He submitted the following table comparing average hourly wage rates in steel industries:

	Rate	Period	Percentage that United States Is Higher
United States	$.883	1937	
England	.40	1937	121
Germany	.345	1936	156
Sweden	.32	1938*	176
Belgium	.17	1937	420
France	.395	1936	123
Italy	.20	1937**	341
Japan	.10	1937	783

These rates were taken from the 1937 year book of the International Labor Office at Geneva, Switzerland, and converted into dollars at the exchange rate prevailing at time wage rates were reported.

*7½ per cent increase effective Jan. 1, 1938.

**Increase in exchange rate of lira.

J. Carson Adkerson, president, American Manganese Producers association, testified in behalf of the domestic manganese industry. The manganese ore duty was previously reduced 50 per cent under the trade agreement with Brazil. Mr. Adkerson asked that the present rate be not "frozen" through the proposed trade agreement with the United Kingdom.

"It has been definitely established that the United States has an abundance of low-grade manganese ores and processes through which satisfactory high-grade manganese ores may be recovered," he said.

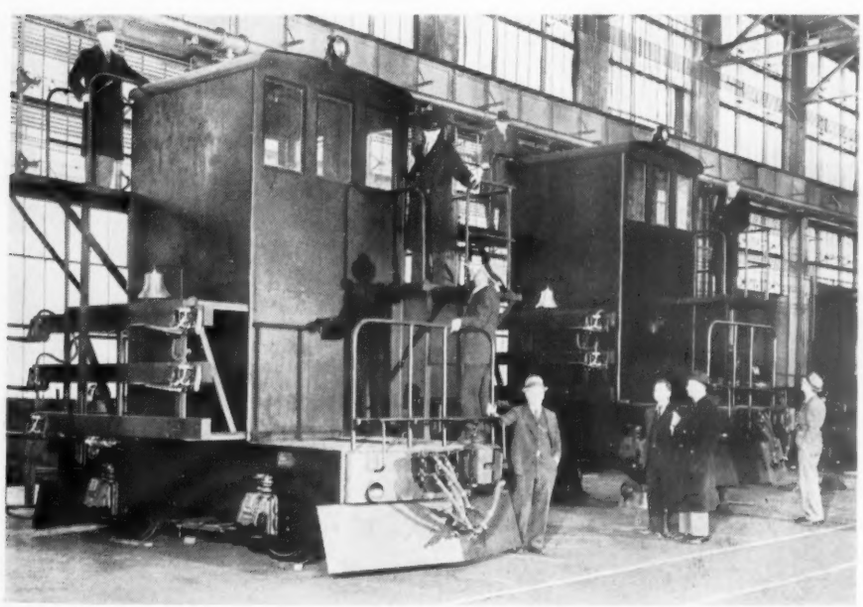
He mentioned the new Leute process applicable to the ores of South Dakota, electrolytic process of the United States bureau of mines, and the new du Pont process, announcement of which was made recently before the senate military affairs subcommittee.

Robert S. Palmer, secretary, Colorado State Mining association, in a short statement asked for retention of the present duty on tungsten.

The American Iron and Steel institute chose to stand on the brief which it filed recently (STEEL, Feb. 28, p. 22). Individual steel producers did not appear, and briefs which it is understood some of them submitted were not made public.

The American Zinc institute, representing 95 per cent of the zinc mining, smelting and manufacturing industry in the United States, filed a brief requesting continuance of present duties. It stated that concessions, if granted, may be as much as 50 per cent of current duties, and under such circumstances many zinc properties would be shut down, "affecting an industry upon which 100,000 are directly dependent."

Steel Plant Locomotives 16 Feet High



■ **Sixteen feet high and only 15 feet long are these locomotives to haul cars of coke from ovens to quenching pit in Great Lakes Steel Corp. plant, Detroit. They were built in General Electric's Erie, Pa., works for Semet-Solvay Co. What appears to be an outside fire escape circling three sides of the locomotive is an observer's platform**

Waste Material Dealers Meet on 25th Anniversary

■ National Association of Waste Material Dealers held its annual meeting in New York, March 14-16, on the twenty-fifth anniversary of its founding. More than 600 attended. All officers were re-elected. Charles M. Haskins is completing his twenty-fifth year as secretary-treasurer.

Principal address pertaining to metals was delivered by E. W. Pehrson, assistant chief, metal economics division, bureau of mines, Washington. From 1907 to 1936 secondary metal production, he said, approximated 9,000,000 tons of copper, 5,000,000 tons of lead, 3,500,000 tons of zinc, 635,000 tons of tin, and 682,000 tons of aluminum.

He expressed himself against export restriction on scrap except under unusual circumstances, on the ground the exports increase employment and are relatively unimportant from the viewpoint of conservation.

Gabriel Heatter, radio commentator, and editor of Edgar T. Ward's Sons Co. house publication, speaking at the closing banquet in Hotel

Czech Steel Far Over Austria's

■ AUSTRIA brings to new Germany relatively small iron and steel resources. Czechoslovakia, half-surrounded by the present German boundaries, has fourfold value as a producer of steel.

Austria's output of pig iron in 1937 was 320,000 tons and steel ingots 625,000 tons. Steelworks in the United States at the present low rate of production could make an equal tonnage in 10 days.

Czechoslovakia has been gaining in steel production and in 1937 made 2,317,000 tons, 48.6 per cent more than in 1936 and 4.4 per cent above the 1929 peak. Its pig iron output in 1937 was 1,675,000 tons.

Alpine Montan Co., Vienna, is the leading steelmaker in Austria, other works being of little importance. Its ingot output in 1937 totaled 424,330 tons, equal to the February weekly production in this country.

Requires 26,000,000 Tons

According to information from Berlin, Germany's steel requirements are estimated at 26,000,000 tons annually. It produced 19,538,000 tons in 1937. With the Austrian production added the total is 20,163,000 tons. The Herman Goering Reich Iron Works was organized to exploit low-grade ores on the engineering estimate that it could provide the remaining 6,000,000 tons annually.

Germany's estimate of its steel requirements is almost equal to the combined ingot output of Great Britain and France, 20,741,700 tons in 1937. Germany's 1937 pig iron totaled 15,708,100 tons, compared with 16,288,000 tons for France and Great Britain.

Italy in 1937 produced 2,100,000 tons of ingots. Russia, aiming at 20,000,000 tons, is estimated to have made 17,000,000 tons last year.

Production figures for 1937 may be taken as representing fairly well the capacity of the various nations as all were pressing for as large output as possible.

One important factor may be vastly changed in the event of hostilities. This is the flow of steel scrap from the United States. Europe in 1937 took almost 2,000,000 tons, which went into the steel represented in the foregoing figures. Interruption in the free flow of scrap might make a wide difference in relative steel production.

TOOL STEEL MAKER BALKS AT NAZI BANNER

Dr. Victor Francis Tlach, president, Darwin & Milner Inc., Cleveland, tool steel manufacturer and dealer, has resigned as consul general for Austria in Ohio, Kentucky and Tennessee. This action followed an order from Nazi authorities to fly their flag over his consulate.

Dr. Tlach, 65, son of an Austrian army officer, went to Sheffield, England, in 1894 to represent an Austrian steel firm. There he was active in development of high chromium steels. At the beginning of the World war he was in the United States and established an American division of his Sheffield interests. He moved to Cleveland in 1921.

Westinghouse Expansion Will Cost $1,250,000

■ Additional manufacturing and warehouse facilities will be built by Westinghouse Electric & Mfg. Co. at its East Springfield, Mass., works. Buildings will be of modern brick, glass, concrete and steel construction.

Expansion program is partly to take care of anticipated increase in business, especially air conditioning, in new housing programs, and partly to accommodate transfer of certain manufacturing operations from Chicopee Falls, Mass.

The new manufacturing building will have 100,000 square feet of floor space. The two-story warehouse will have 230,000 square feet of storage space. Total expenditure, including machinery, will be about $1,250,000.

Fairbanks, Morse in New Chicago Quarters

■ Fairbanks, Morse & Co. last week formally opened its display room on the first floor of the modernized and renamed Fairbanks-Morse building, 600 South Michigan avenue, Chicago.

Dominating the exhibit is a 10-ton, 8-cylinder diesel engine for marine service. Grouped about this are electrical machinery, pumps, scales, railroad and farm equipment, household appliances, automatic coal burners and air conditioners, products manufactured in Fairbanks, Morse factories throughout the country and sold all over the world.

The exhibit room is geometrical rather than moderne in architecture, and a power motif is carried out by a gear design in the floor. The color scheme of the entire display is aluminum with vermillion trim.

Near Original Offices

The company early in January moved its general offices to this new location from 900 South Wabash avenue, headquarters of the firm for a third of its 108 years. Present offices are but eight blocks from the site of the first Fairbanks, Morse store in Chicago on State street near Madison street.

The firm was first known as Fairbanks & Greenleaf Co. After its property was destroyed by the Chicago fire in 1871, Charles Hosmer Morse began business as Fairbanks, Morse & Co. As the company grew and required larger quarters, it moved first to the northwest corner of Lake and LaSalle streets, later to Franklin and Monroe streets, then to 900 South Wabash avenue, and now to 600 South Michigan avenue.

These new quarters, formerly occupied by the International Harvester Co. have been completely remodeled and redecorated.

Fairbanks, Morse executive, sales and departmental offices now occupy the first five floors of the building, totaling about 60,000 square feet of floor space.

■ Ten-ton, 8-cylinder diesel engine features Fairbanks, Morse & Co.'s new display room in Chicago. Company's first property was destroyed by the great Chicago fire in 1871. Present headquarters are a model of practicality and attractiveness

MEETINGS

COKE OVENS TOPIC FOR CHICAGO DISTRICT GROUP

■ BLAST Furnace and Coke Association of the Chicago District will hold a dinner meeting at Hotel Shoreland, Chicago, March 22. William H. Wright, vice president, Semet-Solvay Engineering Corp., New York, will present an illustrated discussion on the "Semet-Solvay Vertical Flue Combination Oven."

ADVISORY BOARD TO STUDY TRANSPORTATION PROBLEMS

Great Lakes Regional Advisory board will conduct its forty-fifth regular and fifteenth annual meeting at the Commodore Perry hotel, Toledo, March 23. All producers, receivers and shippers of freight, and other representatives of industry, the railroads and public are invited to attend.

The program will consist largely of committee reports, including those on automobiles; automobile parts and accessories; coal, coke and ore; industrial and agricultural machinery; iron and steel; nonferrous metal products; and stoves, boilers and heating apparatus. David R. Wilson, president, Willys-Overland Co., Toledo, will address a luncheon meeting.

NEW ENGLAND FOUNDRYMEN PLAN ANNUAL CONFERENCE

Second annual New England foundry conference, sponsored by New England Foundrymen's association, American Foundrymen's association, and Massachusetts Institute of Technology, will be held at the institute in Cambridge, Mass., April 8-9. The program will consist of several addresses, papers and demonstrations. Many of the institute's laboratories will be open for inspection.

A paper, "Application of Dust Control Principles to Foundry Operations," by Ralph R. Meigs, Liberty Mutual Insurance Co., Boston, is to be presented at the opening session on the morning of April 8. In the afternoon, P. E. Kyle, department of mechanical engineering of the institute, will give a demonstration of crystallization.

Dr. V. Bush, vice president of the institute, and Marshall Post, vice president, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., and vice president, American Foundrymen's association, will address the dinner in the evening.

H. W. Dietert, Harry W. Dietert Co., Detroit, will discuss "Sand Control" and make a sand test demonstration at the morning session on April 9. A discussion of "Training Foundry Engineers in Technical Schools" will take place at a luncheon, this to be followed by a discussion conference on "Casting Defects, Causes and Remedies."

"Tax to Determine Business Trend"

■ Tax policies adopted at this session of congress largely will determine whether the recession continues or recovery is resumed, declared William J. Kelly, president, Machinery institute, Chicago, before the senate finance committee hearing on the revenue bill last Friday.

Speaking on many phases of taxation and business, Mr. Kelly said the house had not gone far enough in its actions on taxes affecting industry.

"The constructive attitude of your committee is well known. We applaud it for we know your purpose is to deal realistically with the important problems involved," he said.

"If congress takes full advantage of its opportunity it will lead the country on a course of encouragement and hope which will enable business to make new advances upon our great economic frontiers."

Foundry Equipment Order Index Advances

■ Foundry equipment orders in February reversed their downward course, according to the Foundry Equipment Manufacturers' association. Net orders index for February was 90.4, compared with 76.8 in January and 111.2 in December. In February, 1937, the index was 248.5.

Shipments, however, continued to decline, the index being 80.9 compared with 147.7 in January and 201.8 in February, 1937. Unfilled order index for January was 157.1, compared with 147.7 in January and 380 in February, 1937. The indexes are based on figures of 1922-24.

Wheeling Renews SWOC Pact, with 10-Day Clause

■ Wheeling Steel Corp. and Steel Workers' Organizing committee have signed a contract for the company's plants at Wheeling and Benwood, W. Va., and Portsmouth, O. This is a renewal of the previous contract, but contains a proviso for reopening negotiations upon ten-day notice by either party. The agreement is substantially the same as that signed by United States Steel Corp. subsidiaries and other steel companies.

Less-Carlot Rates Up March 28

■ RECENTLY authorized freight rate increases will become effective March 28 on less than carlot shipments. Failure of the carriers to file new tariffs on carlots will delay the effective date of increases on those shipments for a few days.

Delay in filing carlot tariffs last week was attributed to necessity for adjustments in carlot rates.

On less than carlot rates, fractions under a half cent will be eliminated, those over a half cent will take the full cent. Ruling on fractions affecting carlot rates still was conjectural last week.

New increases on less than carlots will have an important bearing on free store-door deliveries at a number of points. The ruling provides for free store-door deliveries on all rates of 45 cents and higher. The recent increase will elevate many rates to this bracket. For instance, rate on less than carlot shipments from Pittsburgh to New York will be increased from 42 cents to 46 cents.

At press conference last week, President Roosevelt admitted little progress had resulted from a conference seeking a solution to the railroads' problem. Asked what he thought about railroad wage reductions, the President replied he had not given the matter consideration, but gave his offhand opinion that it would be unwise.

Dr. Merica Receives John Fritz Medal

■ The John Fritz medal, highest honor in the engineering profession, was formally presented to Dr. Paul Dyer Merica, vice president, International Nickel Co., at a dinner celebrating his forty-ninth birthday, at the Metropolitan club, New York, last Thursday.

The medal is awarded jointly by the American Society of Civil Engineers, American Institute of Electrical Engineers, American Society of Mechanical Engineers, and the American Institute of Mining and Metallurgical Engineers. Last week's dinner was under the auspices of the latter group of which Dr. Merica is vice president and director.

Dr. Zay Jeffries, General Electric Co., Nela Park, Cleveland, made the presentation speech in which he reviewed the career and achievements of the medalist. For formal award of the medal to Dr. Merica see STEEL, Nov. 1, p. 33.

Year's Steel Distribution Through Warehouses Establishes New Record

■ WAREHOUSE sales of finished steel products reached an all-time peak in 1937, 4,342,000 gross tons, exceeding the previous high mark, in 1936, by 234,000 tons.

This record is 352,000 tons above the pre-depression top attained in 1929, when total output of finished steel was about 19 per cent greater than in 1937.

Distributors maintained second position as an outlet for finished steel products, being surpassed only by the automotive industry. They accounted for more tonnage than either the railroads or building industry.

Nearly one-seventh, or 13.28 per cent of the finished steel made in 1937 was shipped into warehouse stocks for resale to 250,000 users.

This analysis relating particularly to warehouse sales was made by Walter S. Doxsey, executive secretary, American Steel Warehouse Association Inc., Cleveland, based on STEEL'S surveys of general distribution (March 14, p. 23).

Principal product sold by distributors last year was pipe and tubing, 1,083,000 tons. Second in importance was wire products, 722,000 tons; third, galvanized sheets, 676,000 tons; fourth, all other sheets, 488,000 tons; fifth, merchant bars, 409,000 tons. Other products in order: Structurals, 280,000 tons; plates, 254,000 tons; concrete bars, 213,000 tons; strip steel, 84,000 tons; miscellaneous finished steel products, 58,000 tons; tin mill black plates, 42,000 tons; rails, 16,000 tons; angle bars and track accessories, 16,000 tons.

Galvanized Sheets Set Record

The 676,000 tons galvanized sheets sold through warehouses last year —52 per cent of the total output of that product—is an increase of 68,000 tons over 1936 and 263,000 tons in excess of the 1929 total. Distributors' sale of various grades of sheets, not including galvanized, was 75,000 tons above the previous high.

Although more tubing and pipe was sold in 1937 than in 1936, the total was 158,000 tons under the peak established in 1929. The 254,000 tons of plates delivered to warehouses in 1937 topped the 1929 high by 9000 tons. Warehouse distribution of concrete bars advanced to 213,000 tons from 191,000 tons in 1936. This compares with 104,000 tons in 1929.

Figures for one important product distributed from warehouse stocks—cold-finished steel—are not included in this compilation because mill reports show hot-rolled bars sold for cold-finishing as semifinished steel.

While the percentage of total finished steel handled by warehouses was less in 1937 than in any year since 1931, last year's figure—13.28 per cent—is considerably higher than for any other year with comparable steel production. In 1929, for example, only 11.05 per cent went into distributors' stocks; the figures for 1928, 1927, and 1926 are 10.83, 12.82, and 10.52 respectively.

"Apparently the proportion of steel sold through distributive channels is steadily increasing," says Mr. Doxsey. "Obviously, the percentage of warehouse steel will decline in years of great activity by the automobile builders and when demands from the railroad and building industries and other major consumers are accelerated.

"Conversely, when these important users are operating on limited schedules, the more stable requirements of distributors are reflected in relatively higher percentages of the total. This was pronounced during the depression years when, in 1932, a maximum percentage of 16.12 was reached."

Figures from STEEL'S surveys showing total production of finished steel products, the tonnages sold by warehouses, and their percentages of totals for past 12 years follow:

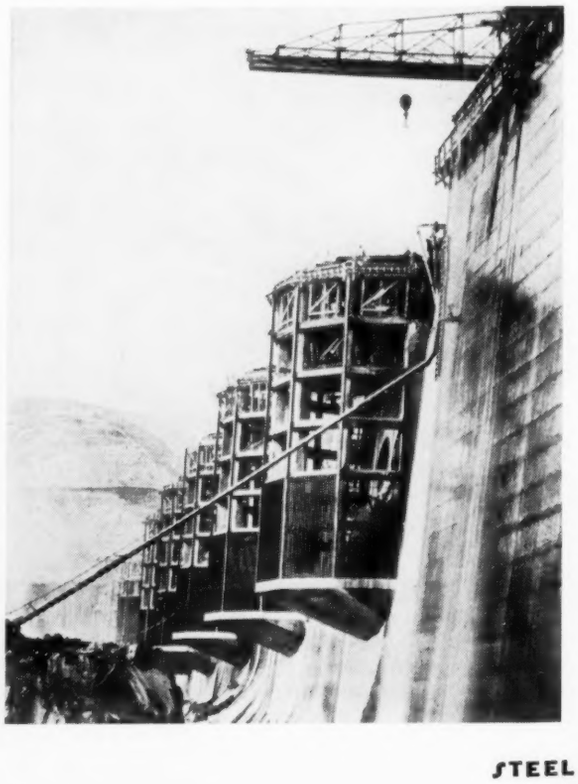
Year	Total Production Gross Tons	Sold by Warehouses Gross Tons	Per Cent of Total
1937	32,695,349	4,341,906	13.28
1936	29,072,596	4,108,497	14.13
1935	20,819,710	3,005,129	14.43
1934	15,870,696	2,225,753	14.02
1933	13,743,121	2,049,403	14.91
1932	9,317,974	1,501,736	16.12
1931	17,396,997	2,205,570	12.68
1930	25,769,914	3,147,249	12.21
1929	36,157,095	3,990,122	11.05
1928	28,537,621	3,091,715	10.83
1927	28,182,187	3,613,225	12.82
1926	29,656,836	3,121,960	10.52

U. S. Steel's Northern Ore Carriers To Merge

■ Interstate commerce commission last week granted permission for merger of properties of Duluth, Missabe & Iron Range railway, Duluth & Iron Range railroad and Interstate Transfer railroad, subsidiaries of United States Steel Corp., into one corporation for ownership, management and operation. The company will be called the Duluth, Missabe & Iron Range railway.

■ To help promote better labor relations, a series of talking still pictures dramatizing plant and personnel problems and methods of solving them have been made available by MacVeagh & Co., New York. They are designed for showing at foremen's meetings.

"Bay Windows" for Grand Coulee Dam



■ Trash racks, resembling bay windows, are being installed in the face of Grand Coulee dam. Each rack is 11 feet 11⅛ inches wide and 10 feet ¼-inch long weighs 4300 pounds. Tolerance requirements were ⅛-inch in overall width and length, ⅛-inch variation in overall diagonal length and not more than ⅜-inch from a true plane. The racks were fabricated by Arthur J. O'Leary & Sons Co., Chicago, using the shielded arc welding process with equipment supplied by the Lincoln Electric Co., Cleveland

From Archimedes To Steel's Future

■ REPUBLIC STEEL CORP. last week formally opened its $15,000,000, 98-inch continuous strip mill in Cleveland. Several score newsmen and business paper editors inspected the new mill, were guests at luncheon at Hotel Cleveland and dinner at the Union club.

T. M. Girdler, Republic chairman, speaking at the dinner expressed hopefulness concerning long-term steel prospects.

"Today there are various factors which are putting the brakes on business. When this picture changes, when the brakes are removed and business once more has the confidence to go ahead, we expect to see this mill turn out more strip steel than Cleveland has ever seen before."

Mr. Girdler declared his "firm conviction that there is almost no limit to future markets, especially markets for flat-rolled steel."

Some of the difficulties encountered in building the plant were recounted by C. M. White, vice president in charge of operations.

Guests were welcomed at luncheon by R. J. Wysor, president.

"You have just inspected one of the miracles of modern industry," he said, "a plant which in its development has drawn upon the inventive genius of man through the ages, from Archimedes down to the little-known modern inventor whose brain child has been one of those mechanical or electrical gadgets whose marvelous precision makes possible the successful operation of the whole great mill."

Mr. Wysor was introduced by E. L. Shaner, editor-in-chief of STEEL, spokesman for press representatives at luncheon and dinner.

For technical description of the mill see pages 36-39.

Carboloy Will Build $500,000 Detroit Plant

■ Carboloy Co. Inc. will build a $500,000 factory and general office building on a 40-acre tract on Eight-Mile road, Detroit. The company, a General Electric Co. subsidiary, manufactures cemented carbide tools an dies.

Scheduled to be completed in the fall, it is designed to accommodate the entire manufacturing facilities of Carboloy plants now located in Cleveland, Stamford, Conn., and Detroit. At capacity the company employs about 500 persons.

Manufacturing plant will be a one-story building with an area of about 100,000 square feet. A two-story research laboratory and factory office structure will adjoin the plant. Facing Eight-Mile road will be a two-story general office building.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Mar. 19	Change	Same week 1937	Same week 1936
Pittsburgh	30	+ 4	91	18
Chicago	30	+ 2.5	82.5	63.5
Eastern Pa.	29	None	58	38
Youngstown	27	— 2	85	74
Wheeling	38	None	97	55
Cleveland	30.8	+ 2.8	82	79
Buffalo	28	+ 9.5	87	47
Birmingham	61	None	80	69
New England	15	None	97	56
Cincinnati	25	— 7	72	76
St. Louis	37	None	82	†
Detroit	33	None	100	94
Average	32	+ 2	89	50

†Not reported.

FINANCIAL

■ NATIONAL Steel Corp., Pittsburgh, has declared a dividend of 25 cents per share on its capital stock, payable March 31 to stockholders of record March 25. There are 2,167,877 shares outstanding. E. T. Weir, chairman, said: "The dividend will be earned conservatively in the first quarter."

♦

Wickwire Spencer Steel Co., Buffalo, reports net profit of $592,466 for 1937, against $431,384 in 1936.

♦

Empire Sheet & Tin Plate Co., Mansfield, O., reports 1937 earnings totaled $243,415 before bond interest and depreciation, against $151,000 in 1936. Operations are scheduled to start March 21 in the company's new mechanized sheet mill, built at a cost of $250,000.

♦

Directors of Sharon Steel Corp., Sharon, Pa., took no action on a common dividend at their annual meeting, but declared a regular quarterly payment of $1.25 a share on preferred, April 1 to holders of record March 25.

♦

Mesta Machine Co., Pittsburgh, reports for 1937 net profits of $4,668,029, after all charges including $124,292 surtax on undistributed profits. This is equivalent to $4.67 a share on $5 common stock.

♦

For 12 months ending Jan. 31, Otis Steel Co. reports net profit as $2,018,576, equal to $1.38 a common share. This is a gain of $38,427 over $1,980,149 reported for calendar year ending Dec. 31, 1936.

PRODUCTION

■ STEELWORKS operations last week advanced 2 points to 32 per cent, important increases being made at Pittsburgh and Chicago and most centers remaining unchanged. Youngstown and Cincinnati showed slight declines.

Pittsburgh — Up 4 points to 30 per cent on stronger schedules by larger producers.

Wheeling — Unchanged at 38 per cent for fourth consecutive week.

Chicago — Increased 2½ points to 30 per cent, highest rate this year and 5½ points over the year's low.

St. Louis — Steady at 37 per cent for second consecutive week.

Birmingham, Ala — Continued at 61 per cent with 11 open hearths in operation.

Buffalo — Gained 9½ points to 28 per cent, highest since Nov. 18. All three important interests increased active capacity.

New England — For fourth week steady at 15 per cent. A slight gain is indicated for this week.

Cincinnati — Decreased 7 points to 25 per cent. Addition of three open hearths this week will bring a higher rate.

Detroit — No change from 33 per cent.

Central eastern seaboard — One less furnace is in operation but the rate is steady at 29 per cent for the second week.

Cleveland — Addition of one open hearth last week raised the rate 2.8 points to 30.8 per cent. This rate is expected to continue this week.

Youngstown — Dropped 2 points to 27 per cent, with this schedule expected for this week, though finishing activity will be higher.

6000 Inspect Blaw-Knox Prefabricated Steel House

■ Blaw-Knox Co.'s new prefabricated steel house in Clairton, Pa., near Carnegie-Illinois Steel Corp.'s Irvin works, has attracted more than 6000 visitors since it was opened March 13.

At a preview for business paper editors and newspapermen, W. P. Witherow, president, Blaw-Knox Co., and D. S. Betcombe, designer, explained construction.

Company intends to supply the dwellings in lots of several units to dealers and builders, and through volume production reduce unit costs. Houses will have standardized parts but will be available in various plans. Steel is used throughout in walls, ceilings, frame and roof. Floors are hardwood and sheet insulation is used to back walls and ceilings.

MEN OF INDUSTRY

■ C. I. AUTEN, formerly vice president, Truscon Steel Co., Youngstown, O., has joined the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., as a sales engineer. Following resignation from Truscon Steel in 1936, Mr. Auten went to Orlando, Fla., where he spent the past two years. In his new position Mr. Auten will be responsible for co-ordination of development of steel for new purposes, with particular regard to low-cost housing.

♦

C. B. Stainback, Bernard Lester and C. A. Powel have been appointed managers of the industrial, resale, and industry engineering departments, respectively, recently formed by Westinghouse Electric & Mfg. Co., East Pittsburgh, to meet changing conditions in industrial markets.

The new industrial department will consist of six sections—metalworking, mining, petroleum and chemical, public works and communications, general mill, and marine electrification. The managers of the various sections as announced by Mr. Stainback, manager, are: Leslie M. Gumm, metalworking, in charge of electrification of steel mills and automotive plants; J. S. Parry Jr., mining; Q. M. Crater, petroleum and chemical; J. H. Jewell, public works and communications; G. D. Bowne, general mill electrification, and J. R. Fulton, marine electrification. These appointees are all located at East Pittsburgh.

The resale department will promote the use of company products among machinery manufacturers and other secondary distribution channels such as industrial agents, jobbers and contractors. Those responsible for the activities of the department as announced by Mr. Lester, manager, are: W. D. Turnbull, manager, machinery electrification; J. M. Staples, manager of the appliance electrification section; and L. F. A. Mitchell, manager, construction section. These men are located at East Pittsburgh, with the exception of Mr. Lester who has his headquarters at Pittsburgh.

C. I. Auten

The industry engineering department has been formed to centralize electrical engineering activities of the company relating to central station and industrial power problems. Mr. Powel, manager, announces the department's functions and personnel as follows: A. C. Monteith becomes engineering manager, central station section; and R. D. Evans and C. F. Wagner become consulting transmission engineers. The industrial activities are divided among three sections, the metalworking section, with G. E. Stoltz as manager; the mining, chemical and petroleum section, with Phelan McShane as manager; and the general mill and resale section, with C. W. Drake as manager. H. C. Coleman continues as manager, marine engineering section. All sections are located at East Pittsburgh.

♦

Charles W. Beugless has been appointed district sales manager at Philadelphia for the Eastern Rolling Mill Co., Baltimore.

♦

Charles F. Hosford Jr. will resign April 30 as chairman of the national bituminous coal commission. It is understood he will return to the practice of law in Pittsburgh.

♦

Clayton E. Artman, formerly of the mechanical department, Carnegie- Illinois Steel Corp., Vandergrift, Pa., works, is now superintendent of the masonry department.

♦

George A. Fifield, purchasing agent, Muskegon Piston Ring Co., Sparta, Mich., has been elected secretary and a director of the company, succeeding Mrs. Lou A Keller, resigned.

♦

Glenn Hilliard, assistant open-hearth superintendent, Allegheny Steel Co., Brackenridge, Pa., has been promoted to open hearth superintendent. W. E. Lott succeeds Mr. Hilliard in his former capacity.

♦

C. S. Finegan has been promoted from assistant sales manager, Ingalls Iron Works Co., Birmingham, Ala., to general sales manager. His association with the company dates back 18 years.

♦

Elliott S. Hanson, business manager of *US Steel News*, has been transferred to the office of assistant to chairman, United States Steel Corp., New York. George Ehrnstrom Jr., assistant editor of the *News*, has taken over the business managership.

♦

Joseph Slepian, associated with the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., for 21 years, has been appointed associate director of the company's research

C. A. Powel

Leslie M. Gumm

G. E. Stoltz

Joseph Slepian

R. A. Gezelius

Appointed metallurgist, Taylor-Wharton Iron & Steel Co., High Bridge, N. J., as noted in STEEL, March 14, page 37

laboratories at East Pittsburgh. Prior to joining Westinghouse, Mr. Slepian was an instructor in mathematics at Cornell university.

♦

H. C. McCaughy, heretofore chief engineer, Apollo Steel Co., Apollo, Pa., has been made general superintendent. Frank Oppenheimer has succeeded Mr. McCaughy as chief engineer, and W. H. Richey has become assistant general superintendent, chief chemist and metallurgist.

♦

A. L. Meyer, formerly associated with Alan Wood Steel Co., Conshohocken, Pa., is now district sales manager for the Philadelphia office of Great Lakes Steel Corp., Detroit, with headquarters in the Liberty Trust building. H. S. Erb has been named district manager of sales at Philadelphia.

♦

George W. Rooney has recently been appointed auditor and assistant secretary, National Tube Co., Pittsburgh. He previously had been associated with the Oil Well Supply Co., a subsidiary of the United States Steel Corp., for 11 years, spending five years in Pittsburgh and six in Dallas, Tex.

♦

John B. Mitchell has been named superintendent of rolling mills, Pittsburgh works, Jones & Laughlin Steel Corp. He has been succeeded in his former position at the Aliquippa works by P. H. Devaney, who will be superintendent of blooming, billet and bar mills, 10-inch skelp and 14-inch merchant mills.

♦

Col. Horatio B. Hackett, has been elected president and a director, Thompson-Starrett Co. Inc., New York, to succeed L. J. Fischer, who has been elected chairman of the board. Colonel Hackett, long identified with the building and construction industry, was affiliated in recent years with the public works administration, being assistant administrator. In 1937 he returned to Chicago and became vice president of Coath & Goss, general contractors, and vice president, Chicago Venetian Blind Co.

♦

Wallace H. Rowe Jr., sales representative for the Pittsburgh Steel Co., with headquarters in Pittsburgh, has been transferred to the Los Angeles office as district sales manager, effective April 1. Mr. Rowe is son of the late Wallace H. Rowe, one of the founders of Pittsburgh Steel and its first president.

♦

Theodore J. Kauffeld, chairman and managing director, Inter-Continental Engineering Co. Ltd., London, and also a director of Steel Mill Design & Construction Co. Ltd., sailed from England March 11 for the United States where he will make a tour of inspection of steel companies. Manufacturers of steel mill equipment or accessories who wish to find outlets for their products in the European market can communicate with him during his three-week stay in this country at either the offices of the DeLaval Separator Co., New York, or the Metropolitan club, Pittsburgh.

♦

Ellery R. Fitch, former research engineer, Westinghouse Air Brake Co., Wilmerding, Pa., has been appointed chief engineer of Bendix Westinghouse Automotive Air Brake Co., Pittsburgh. Except for a period during the World war when he served as brigade quartermaster at the Great Lakes training station, he has been with the Westinghouse Air Brake Co. continuously since graduation from Syracuse university in 1912. Previous to becoming research engineer at Wilmerding, he served in the St. Louis office as field inspector and district engineer at New York. S. Johnson Jr., formerly Bendix-Westinghouse chief engineer, assumes the duties of general engineer.

Walter F. Wagner

Mechanical superintendent, Lincoln Motor Car Co., Detroit, who as noted in STEEL, March 14, page 32, was elected president, American Society of Tool Engineers. He previously served with the A. S. T. E. as director and second vice president

Ellery R. Fitch

DIED:

■ WINTHROP C. NEILSON, 60, at his home in Ardmore, Pa., recently Mr. Neilson was vice president, Aluminum Co. of America, which office he held from 1931. He was also president, Republic Mining & Mfg. Co. He also held offices and directorates in other companies.

♦

Lee E. Allen, 52, vice president and chief engineer, Pennsylvania Engineering Works, New Castle, Pa., at New Castle, March 9.

♦

Louis F. Newton, 66, manager of the Interstate Iron & Steel Corp. prior to its absorption by the Republic Steel Corp., at his home in St. Louis, March 6. Recently he had been specialty salesman for the railroad trade for Youngstown Sheet & Tube Co. at St. Louis.

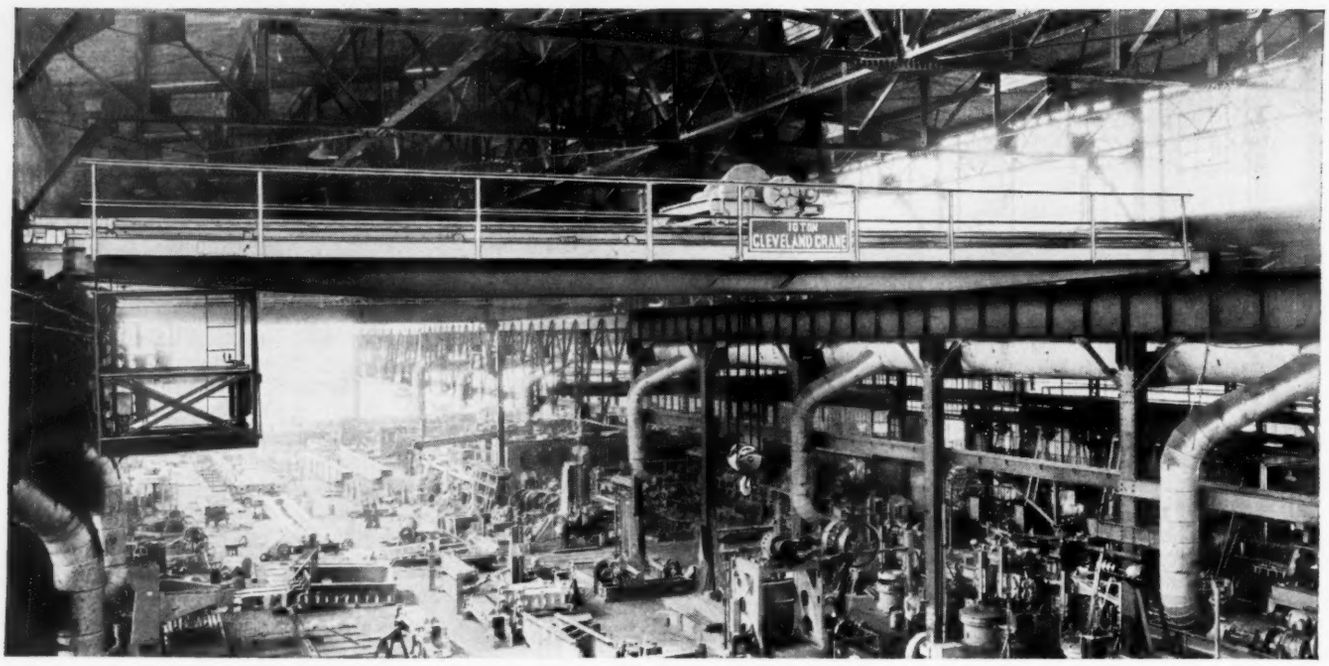
♦

William R. Anderson, 65, for the past five years representative of the Blakeslee Forging Co., Plantsville, Conn., Feb. 28. Formerly a member of the firm of William H. Anderson & Sons, tool manufacturers, about ten years ago he became active in the forging company.

♦

Ralph C. Stiefel, 76, at his winter home near St. Petersburg, Fla., March 15. He was the founder of what is now the Elwood City works of the National Tube Co., and was the inventor of the seamless tube process. He was also the founder of the Aetna-Standard Machine Co., Elwood City.

HYATTS go Hand in Hand with CLEVELAND CRANES on tough jobs

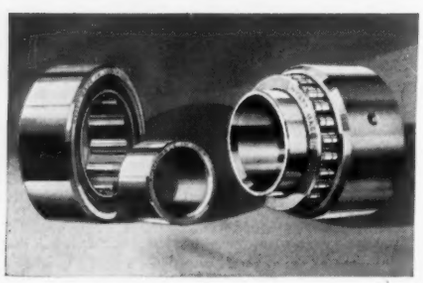


THIS crane has been in continuous operation since it was erected in 1926 and not one of its original Hyatt Roller Bearings has ever been replaced. Hundreds like it have since been built, the majority with Hyatt equipment, and about them the Cleveland Crane & Engineering Company has this to say:

> "Unusual strength and rigidity made possible by the welded construction, provide Cleveland cranes with the necessary requirements to withstand all the strains and abuses of hard and varied working conditions. Because Hyatt Bearings have been found equally capable for tough jobs, we find that they go hand in hand with Cleveland cranes in an admirable fashion."

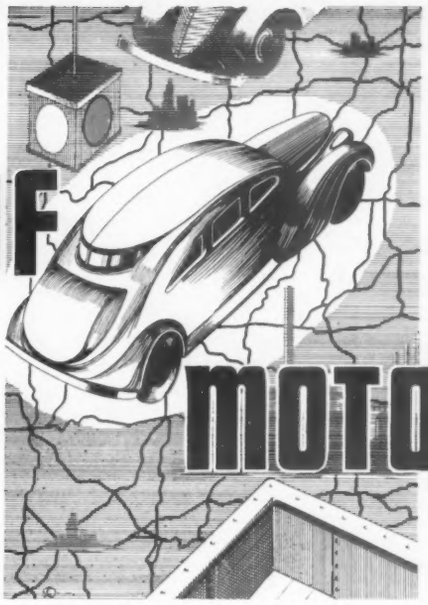
Further proving that it pays to specify Hyatts for long life and dependable operation on all tough bearing applications.

Hyatt Bearings Division, General Motors Corporation, Harrison, Detroit and San Francisco. Hyatt Roller Bearing Sales Company, Chicago and Pittsburgh.



HYATT
Roller Bearings

MIRRORS OF MOTORDOM



BY A. H. ALLEN
Detroit Editor, STEEL

DETROIT

■ BEYOND an encouraging pickup in Chrysler division schedules, the automobile industry as yet has not shown the pre-spring acceleration which normally is experienced. The upswing at Chrysler plants was to be expected, in view of the drastic reductions made in assembly schedules by Plymouth, Dodge, De Soto and Chrysler in the past three months. In February, for example, Chrysler Corp. accounted for 15.24 per cent of total production for the industry, compared with 32.65 per cent a year ago.

Production of the "big three" is normally divided up on the basis of about 40 per cent for General Motors, 35 per cent for Ford, and 25 per cent for Chrysler. In the next few weeks, increases at Chrysler should bring the corporation back nearer the 25 per cent figure.

Dodge Production Rises

Dodge, in particular, has been making relatively the best showing in the Chrysler family. Production last week totaled about 5000 cars and trucks on a four-day basis, and reports were current that consideration was being given to returning the plant to a five-day week shortly. Retail deliveries of new and used cars by Dodge dealers for the first week in March showed an increase of about 6 per cent over the preceding week, and about 12.5 per cent over the first week in February.

Strange as it may seem, Dodge made more cars last month than Plymouth — 13,850 against 13,700 — and at the moment is running only slightly behind Plymouth on assemblies. The spacious new Dodge truck assembly and export plants on Mound road just beyond the city limits are now ready for occupancy, the only decision yet to be reached being the nature of work to be done there. Some equipment in the Dodge main plant may be transferred to the new location.

While tool and die work for the 1939 Chrysler divisions is not expected to be out for several weeks, the tool, die, jig and fixture departments of Briggs, which supplies bodies for all Chrysler divisions, are operating five days a week on 1939 model material, indicating decision has been reached on at least a portion of next year's specifications. It appears likely all Chrysler bodies will come in for complete restyling, and some of the local die shops already have reserved varying periods of "thousands of man-hours" for Chrysler work. This policy of reserving time at tool and die shops has been followed for several years by the large automobile companies here. Early in the season the plants will canvass the die shops to determine how much time is available for their work and then make tentative reservations for portions of this time.

Mechanical and chassis changes for 1939 models are going to be subdued, according to the way things are shaping up now. Many companies have large banks of completed subassemblies and in some cases these banks cannot conceivably be consumed by 1938 model production, even assuming an appreciable increase from the present level. So, the only way to work off these banks is to carry over such parts into 1939 lines unchanged.

■ POPULARITY of the straight-eight engine, say what you will, appears to be on the wane. Buick, of course, making solely straight-eight models, is an exception; but Olds and Pontiac have found public favor swinging strongly toward their 6-cylinder jobs and away from the eights.

A survey made by the Chevrolet market analysis department shows 6-cylinder cars comprising 63.6 per cent of all cars sold in 1937, and 8-cylinder models 34.1 per cent of the total. Naturally, the bulk of the latter comprises models with V-8 engines. Eight-cylinder engines comprised 39.8 per cent of the total in 1934, a figure which dropped 5.7 points by last year.

Naturally these figures represent an effort to indicate public preference for sixes over V-8 engines; but what they really show is the decline of interest in the straight-eight power plant. The V-8 engine, if anything, has been steadily increasing in popularity.

May Drop Eights For 1939

But to return to the matter of the straight eight, both Pontiac and Olds have dual lines of sixes and eights, and the decision is understood to have been reached to abandon the 8-cylinder models for 1939 and concentrate solely on the sixes, incorporating whatever added advantages the eights may have had over the sixes into the new line of sixes.

Pontiac, for example, this year had a spread of about $60 between comparable six and eight, the latter giving 6 inches more wheelbase, added power, and such other extras as starterator, larger tires and the like. Spread between the Olds six and eight amounts to somewhat over $100. Ratio of sales on the Olds is about 4 to 1 in favor of the sixes; and on Pontiac about 3 to 1 in favor of the sixes.

The fact that both the Olds and Pontiac eights are so close to the lowest-priced Buick as far as price is concerned is probably a leading

factor in the decision to drop these straight-eights for 1939.

■ RESULTS of national used car exchange week generally have been all that was expected. J. R. Davis, of Ford, characterized the drive as a "big success," Ford dealers moving 34,000 used cars in the first half of the campaign. M. M. Gilman, of Packard, reported "satisfactory results." Courtney Johnson of Nash noted "a substantial upturn in sales." W. S. Knudsen, General Motors, said GM dealers experienced "lively interest and substantial sales."

At least the automobile dealers of the nation have been put in a much healthier condition as a result of the $1,250,000 dose of advertising tonic, and should now be in better shape to move forward with new car sales. Used car stocks everywhere have been slashed sharply, and the inventory of cash tied up in these cars appreciably lowered.

■ NASH is understood to be making further steps toward concentrating its activities in the Detroit district. One report has the company interested in a new plant site in the vicinity of Plymouth, Mich. Another concerns the proposal to establish a new gray iron foundry in Detroit. Still another connects the company with Graham here, the latter's assembly lines currently being down pending attempts to raise additional financing.

Nash probably could make a profitable deal for the Hupmobile properties in Detroit inasmuch as the Hupp plant appears to have become embedded in a recession morass from which emergence is problematical.

Final folding of the Pierce-Arrow plant in Buffalo appeared certain following announcement of an auction sale of standard tools to be held March 22. This machinery is carried on the company's books at $200,000. Plan to revive the Pierce plant with an injection of $12,000,000 new capital died with the business recession.

Looking back over the years, hundreds of once-great names in motordom have one-by-one dropped from existence until today less than a score of companies survive. The battle is a tough one, and the road to profitable automobile manufacturing is becoming no smoother. Well-informed observers, looking ahead a few years, can see four, or at the most five, companies comprising the automobile industry in this country. Many would like to see the welding together of a fourth large interest, made up possibly of Studebaker, Hudson, Nash, Willys and some of the truck companies. They claim it would stimulate present competition and in the long run make for better automobiles at still lower cost.

Two additional probabilities for 1939 models: Headlamps recessed into front fenders on Nash and Chrysler lines; Chevrolet switching from the enclosed Dubonnet type of independent front spring suspension to the parallelogram type of front axle with open coil springs.

Recent closing of orders for $150,000 worth of high-speed steel tools and $50,000 worth of dies by one of the automobile companies has brightened the outlook for early receipt of new model business.

Bank of Ford 85-horsepower engines is now reported to be at the lowest level since 1933, reflecting the unexpected swing of public favor to the Ford deluxe model in comparison with last year.

Floats of manufactured parts on next year's models are going to be cut down appreciably from the high level unavoidably encountered this year. Production chiefs are now talking about a 10-days' float instead of three weeks to three months.

Rumblings of labor discord were heard again last week as 2500 paraded around Chevrolet Gear & Axle plant in Detroit in protest over hourly-rated foremen doing machine work formerly done by union men, while in Flint a dispute over the number of shop committeemen the UAW was entitled to in Fisher Body No. 1 plant closed the division for an hour. Later the dispute at the Fisher Flint plant spread to the Buick plant, with the result that both Buick and Fisher closed entirely for one week. They plan to resume operations March 23. All suppliers have been notified to hold up shipments one week to ten days.

Negotiations between the UAW and Chrysler Corp. officials have been in process for the past two weeks, both parties seeking to work out a new labor contract to succeed the present agreement which expires March 31. The UAW is insisting upon the right to represent Chrysler office employes. The corporation has 8000 office employes, 2000 at the Highland Park general offices; of the latter group the UAW claims 90 per cent are members. It is unlikely the corporation will accede to these demands. Chrysler office help until recently has been on a four-day week, with consequent reduction in salaries, but now has returned to full time but with a reduction in the salary level.

New DeSoto Convertible

Production of a new convertible coupe has been started by De Soto, featuring a double frame construction for extra rigidity. Elimination of the added strength provided by a steel top has required the use of an additional built-in frame mounted on top of the chassis frame.

Dodge has expanded its line with addition of two 132-inch wheelbase 7-passenger sedans.

"The leg-irons must be taken off the nation's productive forces; the stigma of 'social enemy' must be publicly erased from the brow of American enterprise; prescriptive regulations must be totally expunged and . . . we may regain the momentum of 1937 and may yet take the year 1938 out of the column of retreat and set it in the column of advance," declared W. J. Cameron of the Ford Motor Co. in a recent radio address on the subject of "What Stopped Business?"

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1936	†1937	1938
Jan.	377,244	399,186	228,074
Feb.	300,810	383,900	*220,000
March	438,943	519,022	.....
April	527,625	553,231	.....
May	480,518	540,377	.....
June	469,368	521,153	.....
July	451,206	456,909	.....
Aug.	275,934	405,072	.....
Sept.	139,820	175,630	.....
Oct.	230,049	337,979	.....
Nov.	405,799	376,629	.....
Dec.	518,958	346,886	.....
Year	4,616,274	5,015,974	.....

*Preliminary.

†1937 figures revised.

Week ended	
Feb. 19	59,100
Feb. 26	56,977
March 5	54,440
March 12	57,438
March 19	57,555

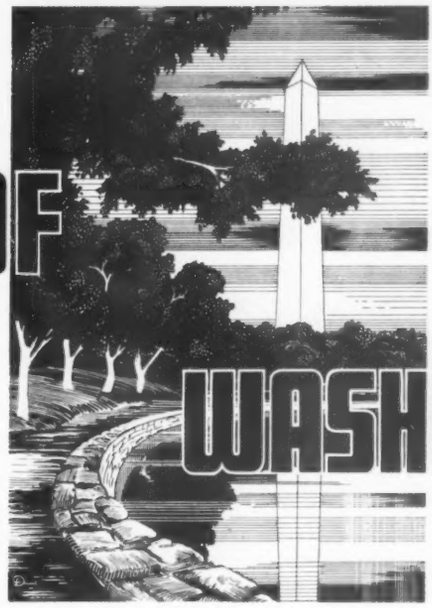
	Week ended Mar. 19	Mar. 12
General Motors	23,860	24,500
Chrysler	12,975	13,475
Ford	12,560	12,060
All others	8,160	7,403

Will Spend $300,000 At Zanesville, O., Plant

■ American Rolling Mill Co. will spend $300,000 in improvements at its Zanesville, O., division, Calvin Verity, executive vice president, announced last week. Improvements will include installation of two continuous furnaces, a new three-high mill, and extension of an existing building to house the new mill. Work will start immediately.

These improvements are part of the company's $11,000,000 program authorized in 1937. Part of the program has been completed and much of the remainder is under way.

WINDOWS OF WASHINGTON



BY L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ HEARINGS were begun last week by the senate finance committee on the new revenue bill recently passed by the house. There is every indication the senate proposes to be more considerate of industry than was the house. Many members of the house felt that body did not move far enough in relieving business of taxes but they were not sufficiently numerous.

Encouragement of new investments and the melting of frozen credits is proposed by Senator Pat Harrison, Mississippi, chairman of the powerful finance committee having charge of revenue matters in the upper house.

Before the hearings Senator Harrison declared that the undistributed profits tax should be killed in its entirety.

"While the house retained only the skeleton of the undistributed profits tax," he said, "the remains will haunt business, and its complete removal and return to a sufficient flat corporation tax is preferable. It is simpler and more understandable."

Fight for Profits Tax

He declared also that the capital gains provisions which the house approved should be revamped to substitute a flat rate for the present sliding scale.

Administration leaders were expected generally to fight abandonment of the principle of the undistributed profits tax, which many business spokesmen have blamed for the current economic slump. The house bill, which must be acted upon by the senate before it can become law, would modify this levy substantially but retain its principle for corporations making net incomes in excess of $25,000 a year.

Senator Harrison also mentioned the possibility of broadening the tax base to bring new taxpayers under the income levy, and of cutting some of the surtax rates on higher bracket individual incomes.

"If I interpret the sentiment of the senate correctly, it desires to do justice and give encouragement to business in every provision of the pending tax bill, within government revenue requirements. I know that is the sentiment of the finance committee. So far as I am concerned, whatever influence I may possess, as chairman of the committee, I shall exert toward raising the required revenue, removing some complicated provisions, and, as far as possible, restoring confidence to business.

"If we can improve the capital gains provisions of the house bill, by taking capital gains out of the general income provisions and applying a flat rate of about 15 per cent on all capital gains from sales of property held over one or two years, it will, in my opinion, encourage new investment and melt much frozen credit.

"I shall make an effort to strengthen section 102 of the present law, imposing a penalty upon the unreasonable accumulation of reserves for the purpose of evading taxation.

"I do not know whether it is possible to be done, and I can give no one any encouragement that it will be done; but if I could write the tax bill at this time, I would reduce some of the high surtax rates. Tax laws should be written for revenue purposes; and when the surtaxes are as high as they are now, the treasury observes diminishing returns, and realizes less revenue.

"I have come to the conclusion that if we are forced to continue an exceptional spending policy, that the income tax base should be broader, resulting in an increased tax consciousness upon the part of the people. I have a conviction, if there is a sit-down strike upon the part of capital because of fear or the uncertainties of investment, that we should break it up, if possible, and that effective work should be done toward removing some of the barriers that are checking the flow of capital and credit into new investments and new industries."

LICENSE BILL CALLED INOPPORTUNE, DESTRUCTIVE

The National Association of Manufacturers has analyzed the revised Borah-O'Mahoney bill to license industry and in a statement last week called it "an amazing example of inopportune and destructive legislation."

The association calls attention to the fact that at present business is uncertain enough without threats of new legislation which would compel thousands of concerns to reorganize and to agree irrevocably to live in a strait-jacket.

The association says: "This seems to embody nearly all of the regulatory ideas that have been imagined. It is an amazing example of inopportune and destructive legislation."

John Harrington, counsel for the Illinois Manufacturers' association, appearing before a subcommittee of the senate judiciary committee on the industrial licensing bill, stated that Illinois industry is "frightened by the bill" not because it is directed at monopoly or specific trade practices but "because of the bureaucratic regulation of all business which it imposes." Mr. Harrington said that "even if political influence could be eradicated, our objections would remain."

Under the bill, Mr. Harrington declared: "The regulation of the pro-

duction and distribution of commodities is placed in the hands of a government agency to bring about redistribution of economic wealth and power."

The bill would require most corporations engaged in interstate business and some others to obtain a federal license, revokable for certain trade practice violations.

W. J. Ballinger, chief economist of the federal trade commission, appearing last week before a subcommittee of the senate judiciary committee in connection with the Borah-O'Mahoney bill, said that enforcement of anti-trust laws "has been sporadic and more political than legal and economic."

He said that if government attorneys had emphasized the economic effects of monopoly they might have won more anti-trust cases. Ballinger also testified that in his opinion many anti-trust cases "have not been properly presented to the Supreme Court."

FREIGHT DECISION MAY CHANGE ICC PROCEDURE

The report in Washington last week in connection with ex parte 123, the freight rate increase case, was that the decision was satisfactory neither to the commission, the railroads nor the public. It is being freely predicted among those who have followed the commission for many years that this decision may result in a change of procedure. It is believed the commission in the future will entirely do away with ex parte proceedings.

The talk here is that the decision was just a shot in the dark, but it is definitely said that the administration did not have any influence in the commission's decision. It is well known that members of this commission are exceedingly jealous of their prerogatives and apparently would not allow dictation.

TRADE COMMISSION GIVEN WIDER BUSINESS CONTROL

After a great deal of delay the senate last week adopted the conference report on the Wheeler-Lea bill, which amends the federal trade commission act by giving that commission considerable more scope and power.

The bill has not yet been signed by the President but it is known that the administration has no opposition to it. The bill gives the commission power to issue complaints for any acts in commerce which it deems unfair and deceptive without having to prove, as formerly, their effect in competition. It provides a civil penalty of $5000 for each violation of a final order of the commission under section 5.

The commission, under the new act, may issue a complaint without waiting, as previously, for action to be initiated by an interested party. It is no longer necessary, the act provides, for the commission to consider and prove the competitive effect of the acts complained of, but may proceed to issue a complaint for any act which it deems unfair and deceptive, regardless of its competitive effect.

Capital Subpoenas Keep Business Men on String

■ Some interesting facts have just come to light in connection with subpoenas issued from Washington for business men and industrialists. It became known at the "Civil Liberties" hearings last week before the special La-Follette senatorial committee that 2044 subpoenas have been issued for industrialists.

The significance of this is that after a witness has appeared before the committee he is still kept under subpoena and does not know when he will be called upon to appear again. This is causing considerable inconvenience and uncertainty.

In addition, similar conditions are said to exist with respect to other committees, and particularly the national labor relations board. It is reliably reported that in the last four years literally hundreds of business men have been "held" to appear when wanted. It is the same, lawyers who have looked into the situation say, as though a witness called by a court were never excused.

PLANS MORE POWER FOR LABOR RELATIONS BOARD

Hearings will begin March 21 in connection with a bill introduced by Senator Wagner, New York, to enlarge the scope of the national labor relations board.

In this connection a report has just been prepared by a committee of the United States chamber of commerce in which it advocates fundamental changes in the labor act to make it more equitable for all parties. This report has been submitted to a sub-committee of the senate committee on education and labor, which will be in charge of the hearings.

A thorough investigation of the administration of the labor relations act is recommended by the national chamber's report before any congressional action is taken dealing with the Wagner amendments. The report suggests also that if the act is to be continued in operation it should include provisions for protecting employes against interference in the exercise of their rights of self-organization, not only by employers but by others.

Senator Wagner's bill would require recipients of government contracts and of loans of federal funds to comply with all the orders and decisions of the labor relations board, whether or not the firms concerned are now subject to the labor relations act.

For the purposes of the bill the board's decisions would be final and conclusive. Upon finding a violation of the labor relations act, the board could authorize the cancellation of contracts and of loans and could prevent violators from obtaining government contracts and applying for further loans until it recommended otherwise.

LABOR LEAGUE PRESSES FOR WAGE-HOUR BILL

Labor's non-partisan league, of which E. L. Oliver is executive vice president and spokesman, is again hammering at members of congress and last week blamed the current business recession on delay in passing a wages and hours bill. In this connection he sent a letter to all of the members of congress.

"Every day of delay in enactment by congress of legislation placing a floor below wages and a ceiling above hours deepens the current business slump," Oliver said.

"When minimum wage and maximum hour standards are fixed by law, removing the possibility of price cuts through further drastic slashing of wages and lengthening of hours, a normal buying program will be adopted."

Oliver's letter hailed the appointment of a subcommittee of the labor committee to draft a bill within two weeks as "the most encouraging development on capitol hill in this session of congress." The letter also pledged full support.

HEAVY EXPORTS TO JAPAN

The department of commerce has just made public a computation of figures showing our import and export trade with Japan.

The department states that iron and steel scrap and tin scrap increased in 1937 in value to $39,278,000 from $14,177,000 in the previous year with an equally large increase in tonnage.

This gain, with smaller increases in exports of wire rods, tin plate and terneplate, etc., brought the total exports of metals and manufactures, except machinery and vehicles, in 1937 to a value of $104,423,000 compared with $28,842,000 in 1936.

The department's figures show also that shipments of American machinery and vehicles to Japan assumed large proportions and were valued at $34,202,000 compared with $20,459,000 in 1936. Power-driven metalworking machinery accounted for most of the increase, although automobiles and trucks registered slight gains.

EDITORIAL

Steel Industry Develops New Outlets As Continuous Mills Increase Capacity

■ SOME of the recently completed continuous strip mills are impressive additions to the steel industry's rolling capacity. That just placed in operation, the 98-inch continuous mill at Cleveland, has maximum delivery speed of 2121 feet per minute in the hot mill. It can roll all finished widths from 30 to 94 inches and all finished thicknesses from 18-gage strip to ½-inch plate. The cold mill is designed to handle single coils, by welding, weighing up to 12½ tons each. The new mill has nominal rated capacity of 840,000 gross tons a year.

First of these mills was built in 1926 and four more were under construction a year later. Despite anxieties as to where enough business could be had to satisfy their great capacity their construction has proceeded steadily. Today they are 26 in number and have total capacity of about 12,600,000 gross tons per year.

Business for these mills has come from the automobile, electric refrigeration cabinet, furniture and many other industries. Many products formerly made of other materials are being made of strip steel. The story of the development of strip steel to fit some of these applications is an epic.

Problems of Adapting to New Uses Are Met By Research

A good example is found in the case of tin plate. At the start considerable difficulty was encountered in attempting to utilize cold rolled strip steel in lieu of the black plate rolled on hot mills. The cold rolled strip was too ductile for use in can bodies. By control of the skin pass and other means the characteristics now can be governed so that cold rolled tin plate retains enough ductility for use in can ends while at the same time being sufficiently stiff for can bodies. It is estimated that some 50 per cent of the tin plate now is made from cold reduced strip and this percentage is increasing.

A recent development yields surfaces, plain or galvanized, to which paints adhere more tenaciously. Continuous galvanizing of cold strip now is in its beginning. One mill is coating cold rolled strip continuously with aluminum. In process of development is the production of cold reduced tin plate by continuous electrotinning. Various studies to furnish strip steel which will be more useful to consumers are in an advanced state. Included are various prefinished types of strip in coiled or sheared form. The study of nonresonant steel construction has made much progress from both the design and metallurgical standpoints.

Industry Becomes Sales Minded And Searches out Wider Fields

Not many years ago the steel industry was criticized because it was not "sales minded." This criticism no longer is valid, as attested by the steel industry's present aggressive promotional and research work. The continuous mills, with their enormous overhead expenses and the driving necessity of providing business for them, have contributed notably toward making the steel industry sales-minded. Now that more of these great mills cry for tonnage, there can be no let-up in this drive to create new business. The result is bound to be a continuous expansion in the use of steel for new as well as existing products.

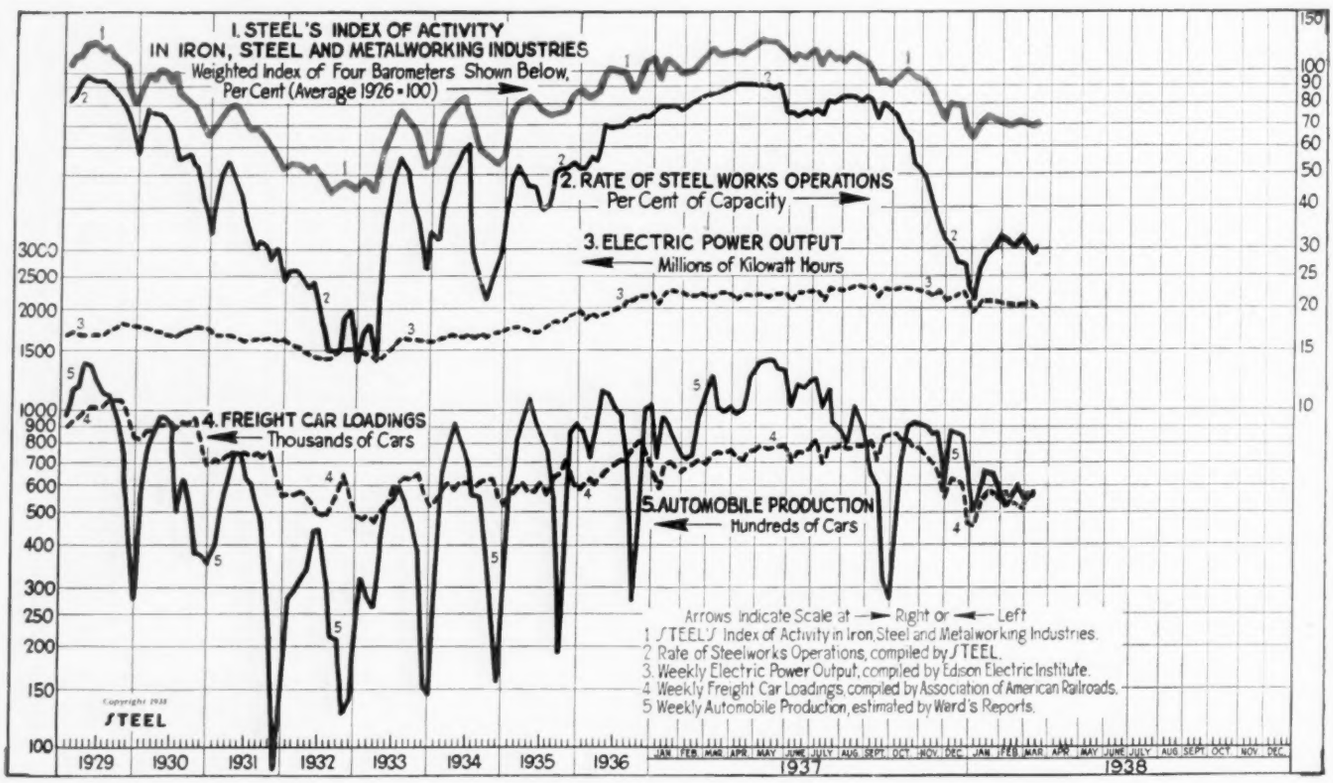
Index of Industrial Activity Shows Modest Gain

■ INDUSTRIAL activity in the iron, steel and metal working industries, as reflected in STEEL'S index, registered a moderate gain of 0.8 point to 70.9 per cent in the week ended March 12. The recent advance was due to the appearance of mildly favorable seasonal factors which exerted a slight upward movement in three of the four barometers of which STEEL'S index is composed.

Steelworks operations reversed the downward movement which had continued since the week ended Feb. 19 by gaining 0.5 points to 30.0 per cent in the week ended March 12. Further moderate improvement in the rate of steelmaking is indicated.

Auto output advanced from 54,440 in the week ended March 5 to 57,438 units in the week ended March 12. It is too early to note any tangible effect of the recent attempt of auto builders to clear up the used car situation, but it is generally felt that dealers are now in a much more liquid position and this should soon be reflected in a gradual upward movement in weekly auto production.

Revenue freight car loadings showed a further encouraging gain to approximately 563,000 cars in the week ending March 12, following the rather sharp increase of 40,886 cars in the preceding week. The recent action on the petition of the roads for a rate increase, while disappointing to the carriers, is expected to result in the release of some buying orders.


1. STEEL'S INDEX OF ACTIVITY IN IRON, STEEL AND METALWORKING INDUSTRIES
Weighted Index of Four Barometers Shown Below, Per Cent (Average 1926 • 100)
2. RATE OF STEEL WORKS OPERATIONS
Per Cent of Capacity
3. ELECTRIC POWER OUTPUT
Millions of Kilowatt Hours
4. FREIGHT CAR LOADINGS
Thousands of Cars
5. AUTOMOBILE PRODUCTION
Hundreds of Cars
Arrows Indicate Scale at → Right or ← Left
1 STEEL'S Index of Activity in Iron, Steel and Metalworking Industries.
2 Rate of Steelworks Operations, compiled by STEEL.
3 Weekly Electric Power Output, compiled by Edison Electric Institute.
4 Weekly Freight Car Loadings, compiled by Association of American Railroads.
5 Weekly Automobile Production, estimated by Ward's Reports.
Copyright 1938 STEEL
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938

STEEL'S index of activity gained 0.8 points to 70.9 in the week ending March 12:

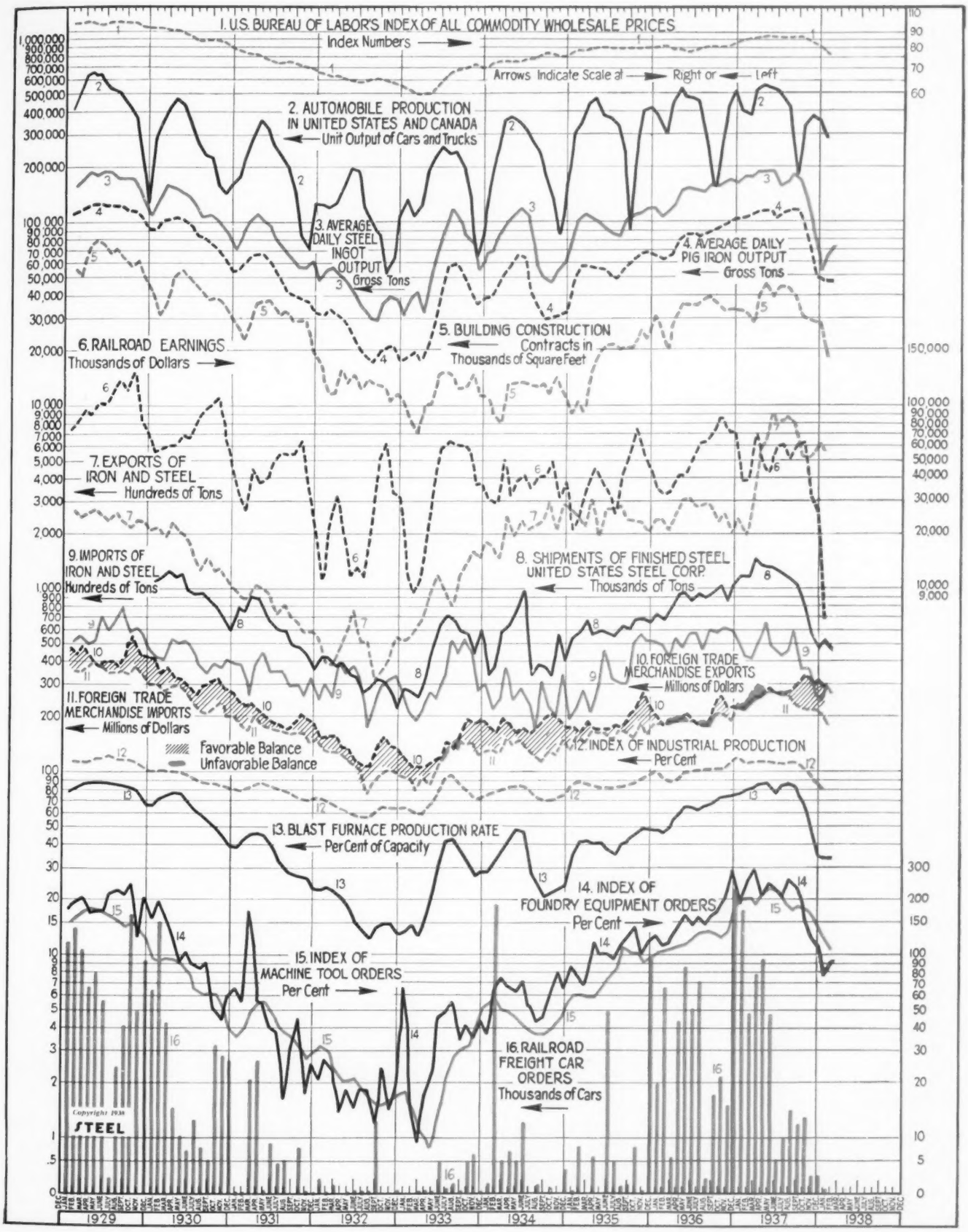
Week ending	STEEL'S Index of Activity Index No.		Steelworks Operating Rate Per Cent		Electric Power Output Million KWH		Freight Car Loadings		Weekly Auto Output	
	1937	1936	1937	1936	1937	1936	1937	1936	1937	1936
Dec. 11	80.5	113.9	27.0	77.5	2,196	2,278	622,131	738,747	85,765	119,455
Dec. 18	79.4	114.8	27.0	79.5	2,202	2,274	603,292	729,696	82,025	121,038
Dec. 25	69.5	93.3	23.0	68.0	2,085	2,080	460,367	562,218	67,230	79,019
	1938	1937	1938	1937	1938	1937	1938	1937	1938	1937
Jan. 1	62.7	96.6	21.0	79.0	1,998	2,069	457,359	587,958	49,550	71,800
Jan. 8	70.1	107.8	26.0	79.5	2,139	2,244	552,314	698,529	54,084	96,780
Jan. 15	74.4	106.7	29.0	79.0	2,115	2,264	580,600	700,238	65,735	91,685
Jan. 22	74.7	104.0	30.5	80.0	2,108	2,256	570,333	670,376	65,418	81,395
Jan. 29	73.8	99.6	33.0	76.0	2,098	2,214	553,176	659,790	59,365	74,148
Feb. 5	70.9	100.8	31.0	79.5	2,082	2,201	564,740	675,026	51,443	72,295
Feb. 12	71.2	101.9	30.0	81.0	2,052	2,199	542,991	691,618	57,810	72,850
Feb. 19	71.9	108.8	31.0	83.0	2,059	2,211	535,790	714,884	59,100	95,698
Feb. 26	70.3	112.8	30.5	84.0	2,031	2,207	511,930	696,727	56,977	111,915
Mar. 5	70.1†	117.9	29.5	86.0	2,035	2,199	552,916†	734,127	54,440	126,975
Mar. 12	70.9*	112.7	30.0	87.0	2,014	2,212	563,421*	748,993	57,438	101,684

*Preliminary. †Revised.

STREND

Key:	Jan. 1938	Key:	Jan. 1938	Key:	Jan. 1938	Key:	Jan. 1938
1	75.6	5	19,200,000	9	29,631	13	33.6†
2	228,074	6	$6,919,879†	10	$289,437,000†	14	90.4†
3	70,969†	7	586,102	11	$170,763,000†	15	112.3†
4	46,655†	8	474,723†	12	81	16	25

†February.



Key: 1. U. S. Bureau of Labor's Index of all Commodity Wholesale Prices. 2. Automobile Production in United States and Canada, compiled by U. S. Department of Commerce. 3. Average Daily Steel Ingot Output, compiled by American Iron and Steel Institute. 4. Average Daily Pig Iron Output, compiled by STEEL. 5. Building Construction, Contract Awards in 37 States, compiled by F. W. Dodge Corp. 6. Railroad Earnings, Net Operating Income for Class I Roads, compiled by Bureau of Railroad Economics. 7 and 9. Iron and Steel Foreign Trade, reported by Bureau of Foreign and Domestic Commerce. 8. Shipments of Finished Steel, United States Steel Corp. 10 and 11. Foreign Trade, Value of Exports and Imports, reported by Bureau of Foreign and Domestic Commerce. 12. Index of Industrial Production (adjusted for seasonal variation; average 1923-25=100) computed by Federal Reserve Board. 13. Blast Furnace Production Rate, compiled by STEEL. 14. Index of Foundry Equipment Orders (Average 1922-24=100), compiled by American Foundry Equipment association. 15. Index of Machine Tool Orders (Three-month moving average; average monthly shipments 1926=100), compiled by National Machine Tool Builders association. 16. Railroad Freight Car Orders, compiled by STEEL.

98-Inch Strip Mill

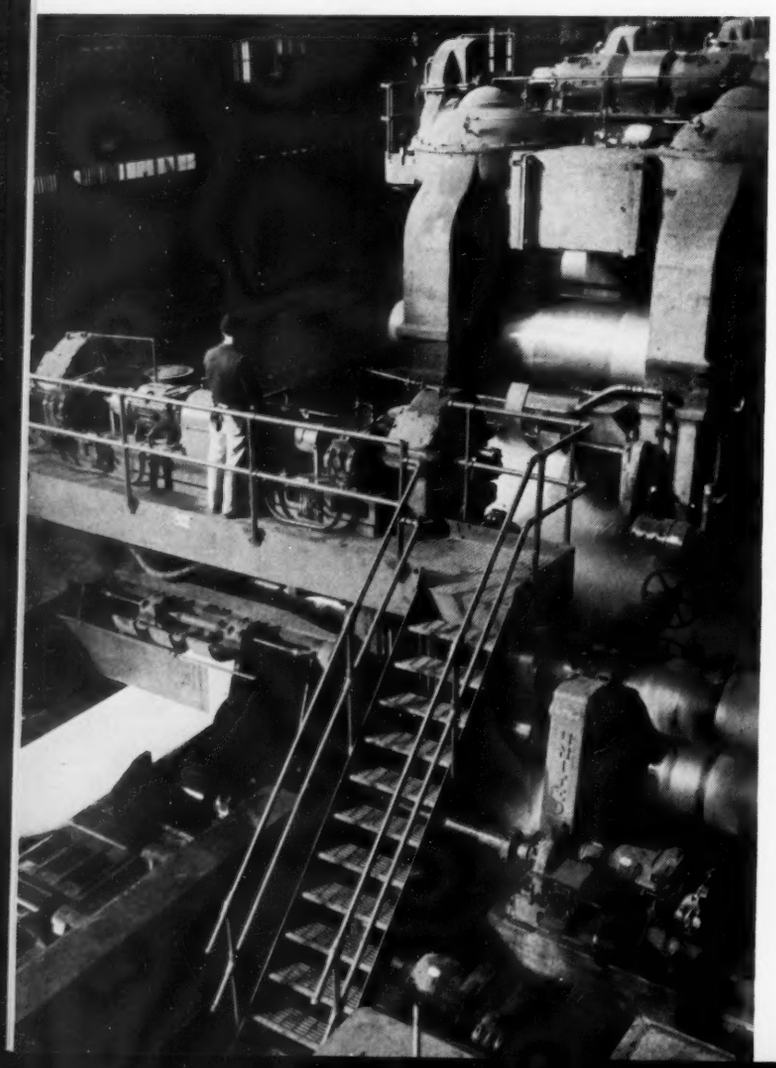
Hot mill delivers up to 2121 feet per minute, rolling from 30 to 94 inches wide and 18 gage to ½-inch thick. The cold mill will deliver coils weighing up to 12½ tons each

This is Part I describing Republic Steel Corp.'s new continuous strip mill installation at Cleveland. This section describes units comprising the hot mill. Part II, dealing with the cold mill and auxiliary equipment, will be presented next week

■ A COLOSSUS in an industry where gigantic machinery and equipment are not uncommon, Republic Steel Corp.'s new 98-inch strip mill at Cleveland embodies recent improvements and developments in lubrication, hydraulics, welding, design of bearings and electrical control. Too, emphasis has been placed on latest advanced plant management practices and techniques for efficient materials handling, metallurgical control, co-ordination of mill operations, and establishment of safe, healthful working conditions.

Maximum delivery speed of the hot mill is 2121 feet per minute. It can roll all finished widths from 30 to 94 inches and all finished thicknesses from 18-gage strip to ½-inch plate. Plant has a nominal rated capacity of 70,000 gross tons per month.

Mill is located on 182 acres six miles from the mouth of the Cuyahoga river. In moving the river to make way for the mill, more than 1,000,000 cubic yards of dirt were excavated. More than 19,000 concrete piles averaging 40 feet in length were driven into the new fill and 120,000 cubic yards of concrete were poured to provide a foundation for superstructure and heavy mill equipment.

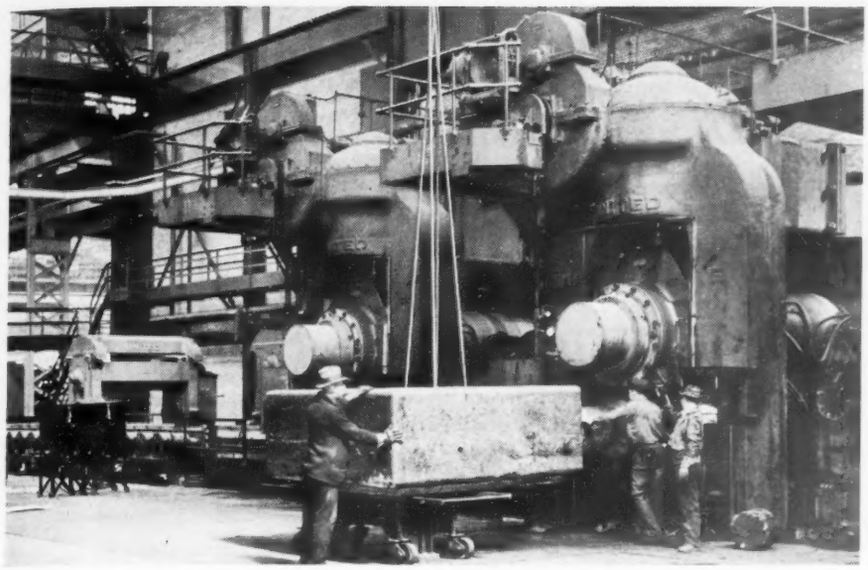


Steel entering finishing scale-breaker. Control pulpit on top of unit with screw-down motors. First finishing stand is on right

The two main structures actually consist of a total of nine large buildings. Other structures include an office building with testing and metallurgical laboratories, welfare building with shower and dressing room accommodations, machine shop, carpenter shop and pump house. Albert Kahn Inc., Detroit, designed the plant.

Location of all machines and equipment in the 21 acres of buildings is worked out for a continuous flow without backtracking. Making "tailor-made" products to meet particular specifications received special attention. Despite the fact that the mill is geared to high-speed production of nearly a million tons per year, it is designed efficiently to turn out relatively small orders of specially processed steel.

Slabs for the new strip mill come from Republic's nearby Corrigan, McKinney plant which has been enlarged and improved. One of the four blast furnaces at this plant was increased to 1,000-ton capacity to provide additional pig iron, and eight soaking pits were entirely



Huge counterweight is used to balance roll weight when changing rolls at one of the finishing stands

rebuilt. A 40-inch blooming mill at the Corrigan, McKinney plant was replaced by a 44-inch mill. Two large slab storage buildings were erected, one 623 x 98 feet at Corrigan, McKinney, and the other 576 x 105 feet at the new strip mill. This latter alone stores 30,000 tons of slabs.

Slabs are charged cold and heated to about 2350 degrees Fahr. in a battery of three end-charged, end-discharged, zone-controlled, triple-fired, continuous furnaces equipped with refractory tile recuperators. Maximum size slab is 48 x 6 inches by 16 feet. Slabs less than 9 feet long are charged in double rows each of which can be controlled independently. Maximum heating capacity of each furnace is 50 gross tons per hour.

Effective inside heating area of each furnace is 80 x 18 feet. Each furnace has a primary and a secondary heating zone. In the former, slabs move on water-cooled skids and are fired by six gas burners above and six below the slab line. In the latter, or soaking zone, slabs move on a special plastic chrome floor and are fired above the hearth level only, with eight gas burners. Heating to rolling temperature is completed in soaking zone and heat within the steel is equalized. Thus any cold or black spots formed on slabs where they rest on skids in the primary zone are eliminated.

Fans Supply Air

Air at about 800 degrees Fahr., required for combustion, is supplied from two refractory tile recuperators by exhaust fans connected to 50-horsepower, alternating-current motors. Capacity is 45,000 cubic feet per minute when handling air at 800 degrees Fahr. against a 2½-inch static pressure.

Fuel used is natural gas at 1000 B.t.u.'s, coke oven gas at 500 B.t.u.'s, or a mixture of coke oven gas and blast furnace gas at 300 B.t.u.'s. Continuous heating from atmospheric temperature to 2350 degrees Fahr. requires about 1,650,000 B.t.u.'s per gross ton of steel. Electric pyrometers automatically regulate flow of fuel gas.

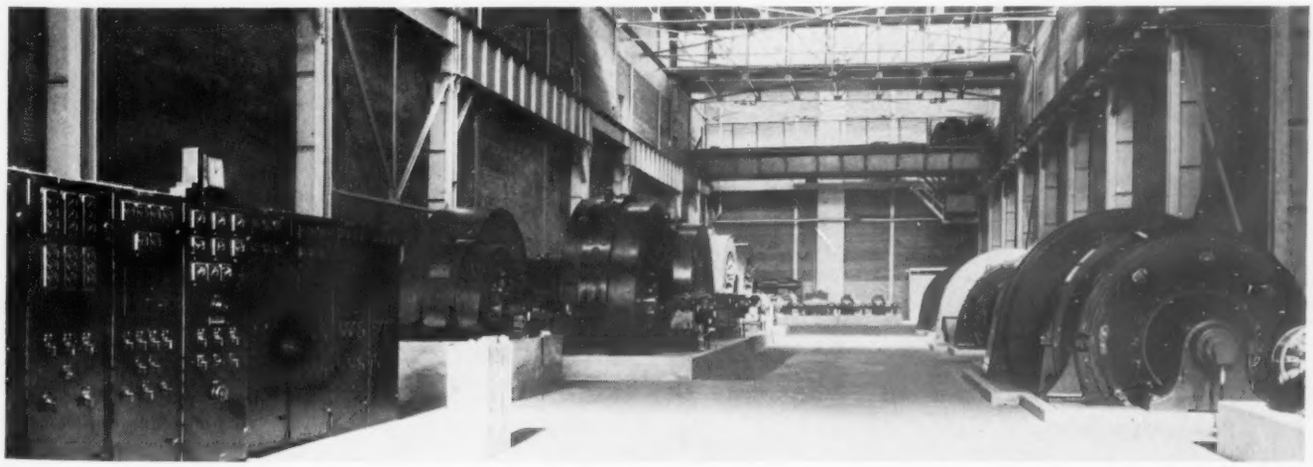
Hearth in the primary zone is constructed of 12 inches of No. 1 grade brick and 5 inches of insulating brick; soaking zone uses 4½ inches of plastic chrome material backed with 7½ inches of No. 1 firebrick and 10 inches of insulating brick. Furnace side walls are 19 inches thick. Furnace roofs are of flat, suspended-arch construction. Each furnace is equipped with a brick-lined flue and steel stack 125 feet high.

A tabular description of the hot mill including the two scale-breakers, the broadside mill, and the three roughing and six finishing stands is shown in the table at top of page 38. Main motors driving each of the mills, rolls and screw-down motors are described in this table, and gear ratio, roll speed and strip speed of each stand as well as distances between stands are given.

Slabs, discharged at about 2350 degrees Fahr., are brought up to the hot mill over a 118-foot delivery table consisting of 59 cast steel rollers, 14 inches in diameter driven by three 50-horsepower direct-current motors. Roughing scalebreaker is designed for a 15 per cent reduction of slabs, enough to crack scale which is removed by a water spray under a pressure of 1200 pounds per square inch.

Broadside mill work rolls are special alloy steel. Back-up rolls weigh 50 tons each. Slabs may be passed straight through or slabs up to 8 feet long may be turned 90 degrees and rolled broadside for spreading to a greater width. A slab turner driven by a 25 horsepower direct-current motor is pro-

Hot mill motor room with 4500-horsepower finishing mill motors at left and 6000-kilowatt motor-generator sets at right



Tabular Description of Principal Mills

	Number of rolls	Distance apart, feet	Rolls: Work roll diam., inches	Rolls: Back-up roll diam., inches	Rolls: Roll length	Gear ratio	Main Drive Motors: Horsepower	Main Drive Motors: Volts	Main Drive Motors: Revolutions per minute	Screwdown Motors: Horsepower	Screwdown Motors: Volts	Screwdown Motors: Revolutions per minute	Roll speed, revolutions per minute	Strip speed, feet per minute
HOT MILL														
Roughing scale breaker	2-high	—	28	..	56	12.2	800*	2300	360	35	230	575	29.5	208.5
Broadside mill	4-high	26 —	40	58	110	37.2	3000*	2300	514	75	230	525	19.1	200
No. 2 Roughing stand	4-high	48 —	27	53	98	16.2	3000*	2300	514	35	230	575	31.6	223
No. 3 Roughing stand	4-high	56 —	27	53	98	11.6	3000*	2300	514	35	230	575	44.2	312.5
No. 4 Roughing stand	4-high	87 —	27	53	98	8.4	3000*	2300	514	75	230	525	60.7	429.1
Finishing scale-breaker	2-high	145 —	28	..	98	11.5	600	600	150/600	15	230	725	13/52	92/368
No. 5 Finishing stand	4-high	23 —	27	53	98	4.1	4500	600	125/250	75	230	525	31/61	217/434
No. 6 Finishing stand	4-high	19 —	27	53	98	2.4	4500	600	125/250	75	230	525	53/105	372/745
No. 7 Finishing stand	4-high	18 —	27	53	98	1.6	4500	600	125/250	75	230	525	78/157	550/1110
No. 8 Finishing stand	4-high	18 —	27	53	98	1.2	4500	600	125/250	75	230	525	109/217	768/1537
No. 9 Finishing stand	4-high	18 —	27	53	98	†....	4500	600	125/264	75	230	525	125/264	883/1866
No. 10 Finishing stand	4-high	18 —	27	53	98	†....	3500	600	150/300	50	230	550	150/300	1060/2121
COLD MILL														
First stand	4-high	—	20½	53	96	6.79	1500	600	300/600	50	230	550	92/184	237/474
Second stand	4-high	16 —	20½	53	96	3.67	2500	600	225/450	50	230	550	127/254	329/658
Third stand	4-high	16 —	20½	53	96	3.02	2500	600	255/450	50	230	550	155/310	400/800

*These are alternating-current motors; other main drive and all screw-down motors are direct-current type.
†Direct drive.

vided on each side of the stand. A motor-operated slab pusher assures proper entry of slabs.

Next unit is a slab reducer to true up slab edges and to flatten out slab for further rolling. It has a 7-inch stroke for 3-inch penetration of a slab 6 inches thick and 10 feet long. Main drive is a 500-horsepower, direct-current motor. Gear ratio is 100 to 1. A crank revolution takes 12 seconds. Slab reducer, 55 feet in length, is cast steel with forged tension bars.

The three roughing and six finishing stands are identical. All are closed-top stands 29½ feet high and 22½ feet wide at top, standing on cast steel bed plates 9 feet 1 inch below mill floor. Housing windows are 61 inches by 17 feet 2 inches with posts 30 inches square. Their pass line elevation varies less than 0.004-inch.

Chromium-vanadium alloy steel is used throughout mill for all pinions and spindles. Back-up rolls are interchangeable, being alike for all nine stands. Work rolls are of cast steel but of three different degrees of hardness. For the three roughing stands they are nickel grain cast steel with hardness 63 to 65 brinell, for first four finishing stands nickel grain cast steel with hardness 68 to 72, and for the last two finishing stands, special process cast steel with hardness not less than 80.

Roll assemblies in all stands are balanced hydraulically at all times. Oil-hydraulic pressure of 1500 pounds is maintained in two independent systems, one each for roughing and finishing stands. Each system consists of a 6-inch hydraulic accumulator, a 5-horsepower, alternating-current motor and a 4.15 gallon-per-minute pump. Work rolls are changed, with C-hooks, using the work roll balance cylinders on 1500 pounds pressure to assist in lifting back-up roll assembly. Control balance is so arranged that any single work or back-up roll in any mill can be removed without affecting pressure on any other roll.

Two motors on top of each housing operate screwdowns, except on roughing scalebreaker and broadside mill where there is only one.

Hot mill runout table is equipped with water spray cooling curtains and 278 identical motors to drive table rollers

Both motors of each unit are interlocked by a magnetic clutch. Each motor is connected with a cam type limit switch and each screwdown is provided with selsyn transmitters and receivers for indication and remote control.

Attached to entry side of each roughing stand is a top driven vertical edger for controlling width of strip and giving edges the required roll finish. Edgers have a range from 32 to 98 inches and consist of tapered chilled rolls, 24 inches in diameter at bottom with a working length of 8 inches. Each edger is driven by a 200-horsepower direct-current motor. Edger roll speed is synchronized with main roll speed through the same control system. Between each edger and roughing stand, hydraulic sprays remove scale which may have formed while in the roughing train.

First two roughing stands have double reduction drives with flywheels mounted on motor pinion shafts. Third roughing stand and first four finishing stands have single reduction drives. Last two finishing stands have motors connected directly to pinion stands. Roughing stands are driven by wound rotor motors. Because strip may be in all six finishing stands at one time, finishing stand motors are variable speed, direct-current with vernier adjustments.

Slab Temperatures Recorded

As seen from the table, distance between roughing stands is sufficient to prevent the lengthening slab from being in more than one stand at a time. The 145-foot delay table following roughing stands consists of two sections of 22 cast iron hollow rollers 14 inches in diameter cooled by general service water sprays under the rollers. Table is driven by two 55-horsepower, direct-current motors, producing speeds from 100 to 400 feet per minute on table surface.

Slab temperature at delay table is carefully watched by the operator, who has a large automatic visual indicator directly before him. Slab temperature as it is rolled is measured by rayo-tube electrical temperature recorders, which make a permanent, continuous record of temperature of each slab at four different points on hot mill, at broadside mill, delay table, last finishing stand, and at either the coiler, if strip is being rolled, or at the end piler, if plate is being rolled.

Finishing scalebreaker has a 3 x 7-foot window opening. Maximum opening between rolls is 6 inches. A double spray of water under 1200 pounds pressure removes scale before slab passes into finishing train. As an extra precaution against scale and dirt in finish rolling, a jet of steam is played across the steel at each finishing stand.

Flying shear for cropping sheets is located 13 feet after the last finishing stand. It has a novel arrangement for catching front crop. Bottom drum of shear is eccentric, causing the front crop automatically to drop by gravity into a chute located just beyond the knife. Two sets of drums are used, one cuts strip into any length from 13 to 27 feet and the other from 28 to 50 feet. Knife pressure is 540,000 pounds, sufficient to shear ½-inch plate. Shear is synchronized with last finishing stand and is driven by two 250-horsepower direct-current motors.

High-Speed Coilers

Two hot coilers, 351 feet from the flying shear, roll up to ¼-inch strip and will take coils that weigh 375 pounds per inch of width. Maximum coils rolled have an outside diameter of 44 inches and weigh 12,500 pounds. Each coiler consists of seven coiling rolls and two pinch rolls, individually motor driven and mounted in heavy cast steel housings below pass line of run-out table. Coilers are capable of handling feed speeds from 971 up to 2566 feet per minute.

An air-operated gate feeds strip into reels and an air-operated pusher discharges the coil to unloaders. Here coils are up-ended, marked, inspected and sent underground by conveyor to pickling, shipping or coil storage department. Special provisions prevent edge marring of coils.

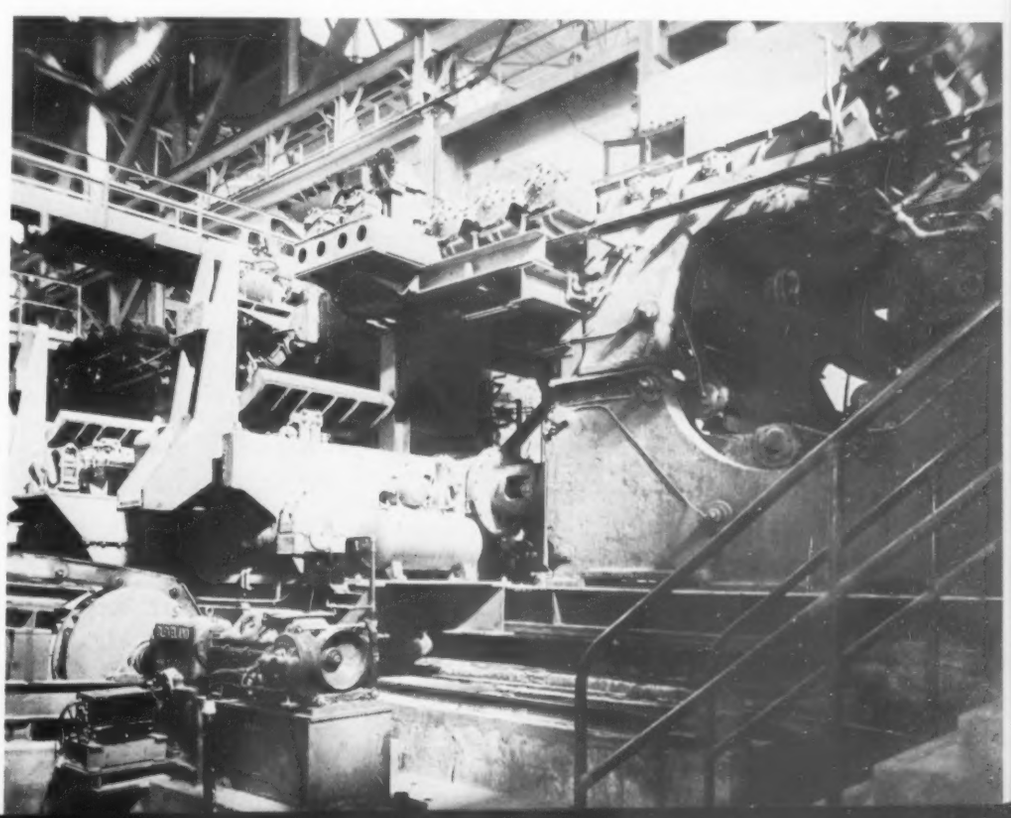
The heated slab runs through all stands, and is rolled into a coil almost a quarter of a mile from heating furnaces in as little as 240 seconds. All stands are equipped with electrical roll-opening indicators which indicate in speed control pulpit as well as on the stands.

Hot runout table between flying shear and the coilers consists of 159 hollow, alloy cast iron rollers with cast iron aprons between them. For 120 feet beyond the flying shear, water sprays cool the sheet.

Beyond the coilers the hot runout table continues for another 262 feet with 119 more rollers, making total length to piler 613 feet. Rollers are driven by individual 4½-horsepower, direct-current motors connected directly to roller shafts giving the table a top speed of 2350 feet per minute. This is the first mill ever designed to use direct-current motors for driving runout table rollers and coilers. These motors are subdivided into groups up to 60 or more, and each group is supplied with power from a direct-current generator with Ward-Leonard control. Runout tables can be started from a dead stop, accelerated to maximum speed and stopped, all in 13 seconds.

At end of hot mill runout table and directly in line with it is a depression type end piler for piling plate cut by the hot mill flying shear. This piler, fed by pinch rolls, has a capacity of 10 tons and can take plate 27 feet long.

(Concluded Next Week)



Inside coiling pit below hot mill runout table. Here strip up to 94 inches in width is rolled into coils and sent by continuous conveyor to pickling lines or hot mill finishing department

Selecting and Buying

Machine Tools and Equipment

By **EDWIN JOHNSON**

Manager of Cost Studies,
Packard Motor Car Co.,
Detroit

■ HAS INDUSTRY solved the problems of selecting and buying tools and equipment? Does the responsibility belong to the purchasing department, master mechanic, tool engineer, process engineer, layout department, time-study department, plant engineer, plant manager, or foreman?

After many years of experience, industry has learned that responsibility belongs to many departments, each department having its specialized function to perform in order that equipment and tools may be selected and purchased with the greatest amount of intelligence and knowledge.

In selecting and purchasing equipment, the tool engineer, who is also known as a process engineer, is charged with the responsibility of planning the various operations necessary to produce the product; of selecting the one best method to adopt; of assigning the equipment required, together with the tools and other supplies necessary; and also the responsibility of eliminating the various troubles and failures which may occur in actual production or performance.

Time Study Plays Part

It is a function of the time-study department to determine proper speeds and feeds for each operation to be performed, as well as to determine the number of pieces to be produced by each tool before regrinding becomes necessary. Therefore, in selecting and buying equipment, the time-study department is given the opportunity to determine feeds, speed and tool life, which later becomes an obligation to equal or exceed in actual performance; and from this information the time-study department will also measure the production to be expected from the proposed machines.

Function of the layout department is to plan the location of machines and equipment, so that the sequence of operations shown on the process routing can be followed with the greatest economy. The size and weight of the equipment, special floors, ventilation problems, operator's position at the machine, and chip removal are all problems of the layout department. Therefore, best results require that the layout department aid in selecting the equipment.

The plant engineer is responsible for all the electrical equipment used on the machines and therefore his standards should be observed in selecting and buying equipment. Inasmuch as he is responsible for the proper installation of both machinery and electrical apparatus, he must also be consulted in reference to various installation problems.

The plant manager and his foreman are charged with the responsibility of operating the equipment selected, and of obtaining the results for which it was intended, and therefore these individuals should be consulted. Quality, quantity, economy, safety, cleanliness and the elimination of the alibi between divisions is a measure of machine satisfaction.

Naturally the functions of the several departments just outlined are subject to variations in different plants; either combined or enlarged according to volume. The functions and procedure, however, will follow closely as outlined.

The process engineer first determines the proposed methods to be adopted, which might be termed a proposed line-up of operations showing the equipment to be used, either now available for use or to be purchased.

Procedure on Quotations

After obtaining the agreement of the master mechanic to this proposed line-up, the process engineer is now ready for quotations on the proposed new equipment. At this point contact with the equipment or machine tool representative is made directly by the process engineer or through a machine specification engineer, who explains in detail the problems involved. The proposed line-up showing machinery which is required is then submitted to each machine representative.

Generally, quotations for the new machinery may be handled in the following manner:

a. All quotations for the proposed line-up must be submitted.

b. Consider the quotation on any alternative line-up in part or entirely, which might be particularly suited to utilizing that particular machine design to its greatest advantage.

With this information, the process engineer can compare and combine equipment now in his plant, as well as methods proposed by

---

No industry spends more year in and year out for new equipment than do automobile manufacturers. And by the same token, no industry makes more exacting demands on its new equipment installations. The question suggests itself: How does a large automobile plant set about to select and buy the proper equipment? The many ramifications of this general query are thoroughly analyzed in the accompanying discussion presented before the annual meeting of the American Society of Tool Engineers in Detroit, March 10. Following Mr. Johnson's remarks are the viewpoints of three others intimately associated with the operation, buying and construction of machinery

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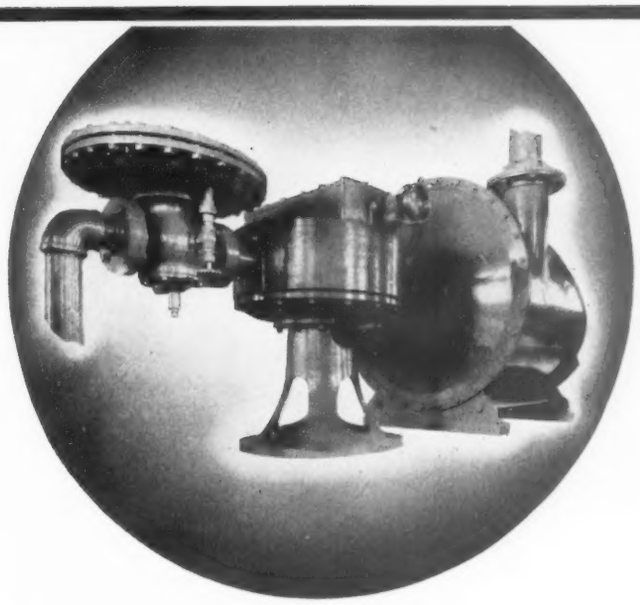
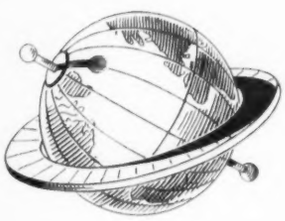


So What?



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the best the market has to offer. These facts will enable him to determine a process on each plan; measure its advantages and disadvantages; and eventually decide upon a method most suitable considering every angle.

Quotations Are Analyzed

When the foregoing analysis is completed, the next step is to analyze the various quotations to determine the exact machinery to be specified. Some of the most important characteristics are:

1. General operation and characteristics of the machinery.
2. Method of holding the piece.
3. Number of pieces per setting.
4. Tools proposed.
5. Speeds and feeds.
6. Feed mechanism.
7. Electrical motors; speed; method of attaching to machinery.
8. Other electrical equipment.
9. Coolant, tanks, piping, pump, kind of coolant, oiling of machinery.
10. Method of cleaning fixture.
11. Accessibility for tool change.
12. Machine repairs.
13. Number of cutting tools.
14. Probable down time of machine for tool changes.
15. Safety features.
16. Special tools or machinery required to grind the tools.
17. Adaptability of machine for plant layout.
18. Delivery.
19. Price.
20. Weight of machinery.
21. Cycle of time of machine, or sometimes called, "floor to floor production time."
22. Average hourly production per hour, per shift, or per day.

When these items have been analyzed and comparisons made of the various quotations submitted, a selection is made and the actual purchase requisition may be written, which should be approved by the master mechanic, process engineer, plant manager, foreman and plant engineer. It is then forwarded to the purchasing department together with a copy of all quotations.

The purchasing agent will determine to his satisfaction the correctness of the requisition, and whether or not the order should be placed. His investigation will determine if the vendor's price is acceptable, the delivery possible, if patent rights if any are satisfactory, if the financial status of the vendor is acceptable, and in general, thoroughly audit any phase of the order he so desires.

Upon a satisfactory completion of this investigation, the purchasing agent then places a purchase order with the vendor for the equipment quoted. The purchase order will state whether or not tools and fixtures are ordered with the machinery. The vendor is then obligated to present his design in sufficient detail to be analyzed by the tool design department, the process engineer and the master mechanic, who will either accept it or revise it to meet the conditions and results desired.

Machinery Is Manufactured

With this approval, the vendor may then proceed to finish the design of the tools, fixtures, and the machine itself; and proceed to the actual making.

Taking a hypothetical case of a purchaser receiving a machine in his plant, it is installed by plant engineering in the location determined by plant layout, and operated at the speeds and feeds predetermined by the time-study department with the fixtures and tools agreed upon by the process engineer, with full expectations of the results originally planned.

If the production supervisor is unable to equal the result planned, he is in a position to go to the exact department responsible, whose responsibility will be to correct the failure and obtain the results anticipated.

Ability of the vendor to work with the process engineer and the plant supervisor during the early life of a new machine is of paramount importance since these few months of operation will tend to prove whether a wise and profitable selection has been made.

* * * *

■ Prime consideration of providing power plants supplying high horsepower at low weight makes the machining problem a peculiar and important one in the aviation engine manufacturing industry, as contrasted with the needs of the automotive industry. Some of the special problems of the aviation companies were reviewed by P. W. Brown, general factory superintendent, Wright Aeronautical Corp., Paterson, N. J., in presenting the shop viewpoint of the subject analyzed by Mr. Johnson.

In selecting machining equipment, accuracy is the first consideration, with finish and speed of production secondary. Designs in the aviation industry rarely last beyond a year or two, so equipment must be sufficiently flexible to meet constantly changing specifications.

High-grade materials and complex heat treatments only add to the machining problems in this field, Mr. Brown pointed out. But he added that fortunately, the builders of machine tool equipment have been anxious to supply all possible co-operation, and their help has gone a long ways toward smoothing the path toward efficient production of aircraft engines.

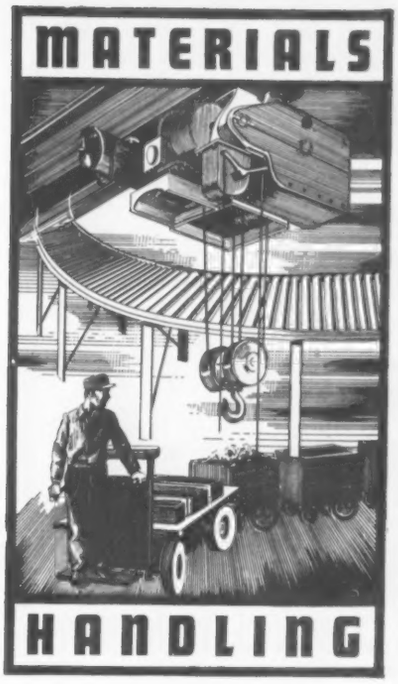
* * * *

■ In the far-flung plants of the General Electric Co. are operated a total of some 25,000 machine tools, about 80 per cent of which are the conventional type or general-purpose machines, according to Tom Higgins, purchasing agent, General Electric Co., Schenectady, N. Y.

Mr. Higgins discussed Mr. Johnson's paper from the purchasing viewpoint and declared that the various manufacturing divisions of his company showed marked pref-

(*Please turn to Page* 64)

Wise selection of machine tool equipment depends upon the co-operation of numerous departments in the buyer's plant, each with an intimate knowledge of a certain phase of production work



Better Shipping

Receipt, stowing, handling and delivery of freight offers big field for savings. New campaign emphasizes advanced methods now giving economies in many industries

J. A. CRONIN, Materials Handling Editor

■ RECEIPT of incoming material along with the packing, stowing and shipping of outgoing freight is definitely linked to materials handling operations at every manufacturing and distributing plant.

In recent years this problem has been accorded deserved recognition in many industries with a resultant reduction in waste of time and space and a consequent saving in handling cost. In certain branches of the metal producing and metalworking industries, greater attention to this class of handling has been most noticeable during the past year or two.

Importance of this subject has been recognized by both railroads and shippers, as emphasized by the decision to repeat again this year the campaign for "Perfect Shipping." The original campaign was initiated in April, a year ago, under the auspices of the Shippers' Advisory Boards. Recent release by operations and maintenance department of the Association of American Railroads of "Recommended Rules for the Receipt, Stowing, Handling and Delivery of Less-than-Carload Freight" also emphasizes this subject.

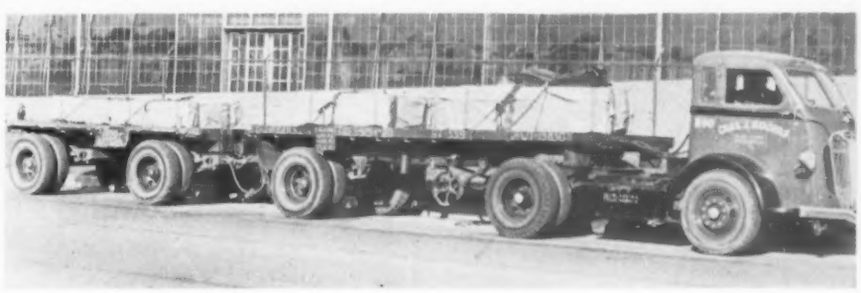
Under the plan of campaign for inducing better shipping practices in American industry, open season is declared on the causes of loss and damage. In preparing the original announcements, declaration was issued that "in the past ten years approximately $275,000,000 have been paid in claims resulting from loss and damage to freight and express." It was emphasized, however, that large as those figures are, they represent only part of the economic loss suffered by industry.

New rules recommended for less-than-carload freight provide shippers with suggestions for carrying out not only inspection and preparation of cars, but also the loading and stowing of their freight in these cars. These rules have been published in a printed booklet within the past few weeks. Included in this contribution to better handling methods are upwards of 100 illustrations of correct methods of stowing freight for shipment.

With special reference to iron and steel articles, covered in Rule 69, illustrations demonstrate a proper method of stowing sheet iron, corrugated pipe and other similar shipments. It is recommended that such items be loaded in the end of car, lengthwise along the car wall; that they be blocked with angular brace or check arrangement; and that they also be blocked at the side with other heavy freight not liable to damage sheets or to be damaged by them. Two methods of blocking are shown in an accompanying illustration. It is noticeable that the illustration also shows modern steel strapping of packs of sheets.

In the rules for stowing machinery, it is recommended that extreme care be exercised in loading and unloading, that contact with adjacent freight be prevented and that when handling on rollers at least two of the latter be under skids at all times. Particular attention is called to the rule that shippers "do not bolt or nail skids to car floor." Machines with overhanging projections

A steel mill recently used this method to protect steel sheet shipments in gondola cars. Galvanized, 16-gage, high tensile wire was tied diagonally over the bundles. Photo courtesy Gerrard Co., Chicago



Shipments by truck also are protected. This 20-ton load of automobile body steel sheet is wrapped in waterproof paper and bound with steel strip. Photo courtesy Autocar Co., Ardmore, Pa.

Wrapped and strapped bundles are not only protected during shipment but are more readily stacked and handled in storage areas such as in this warehouse of a California steel company. Photo courtesy Harnischfeger Corp., Milwaukee

should be placed a sufficient distance from other machines, car walls or ends to prevent damage by contact. Loose parts should not be loaded adjacent to machines where a shift may mean damage. All boxed and loose parts should be securely blocked or strapped. Applications of anti-skid plates and lag screws are covered in detail and adequately illustrated.

Similar rules covering other every day shipping operations have been issued in the past, several sets being of particular interest to shippers in the steel and metalworking industires. Among such are "Recommended Methods Covering the Loading of Miscellaneous Commodities in Closed Cars," originally issued by the transportation division of the American Railway Association in 1928 and revised five years later. In June, 1936, the Association of American Railroads recommended methods "for Loading and Bracing Carload Shipments of Tin Plate on Wooden Skid Platforms."

Only a few months ago, the Freight Container Bureau, 30 Vesey street, New York, after a careful study issued suggestions for packing such products as metal floor lamps and metal utility cabinets. In the past, this same bureau of the American railroads has issued carefully prepared detailed instructions to show manufacturers how properly to pack steel office furniture such as vertical files, transfer cases, knocked-down tables, safes, desks, lockers, doors and storage cabinets.

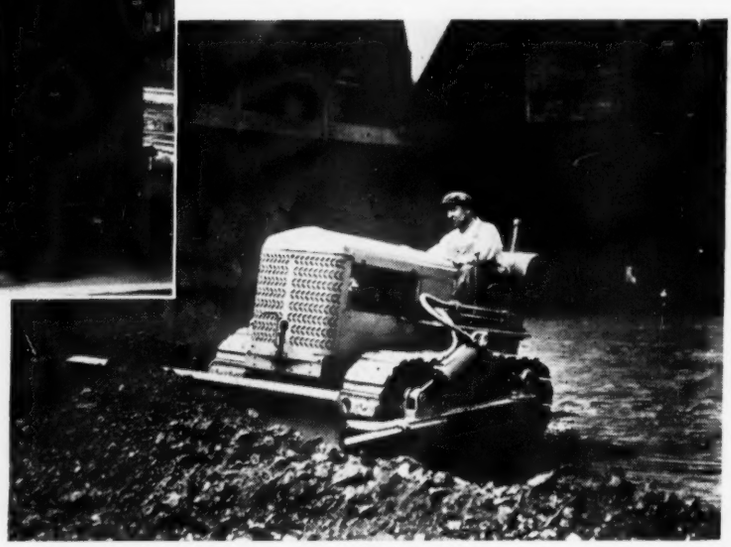
In addition to the foregoing recommendations which are distinct contributions to the literature of packing and shipping, shippers will find considerable help in studying recommendations of various manufacturers of steel strapping and wire tying equipment. Considerable credit goes to this branch of the industry as much of the progress made in reduction of packing and shipping waste has been the result of research in which these manufacturers played an important part.

What savings are possible from this one application of sound packing methods alone are indicated in

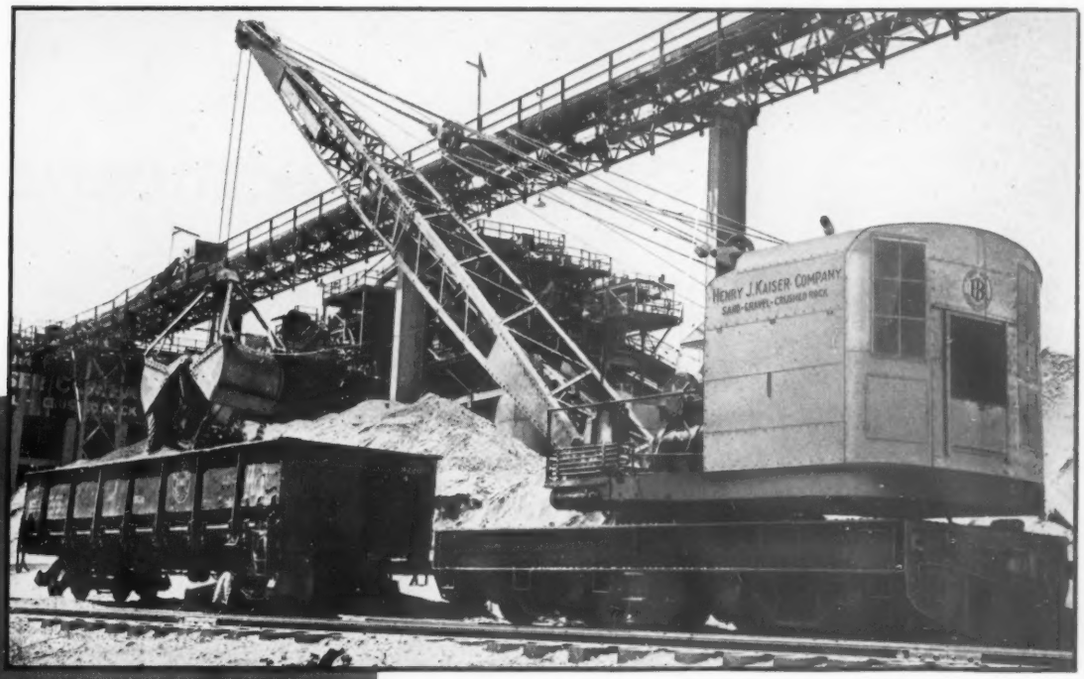
(*Please turn to Page* 66)

Tractor Bulldozer Assists in Cleaning-Up Ore Cargo from Boats

■ **After the orebucket has removed the bulk of ore in the process of unloading an ore boat, this bulldozer, manufactured by the Cleveland Tractor Co., Cleveland, is lowered into the hold, as shown at the left, to assist in the clean-up operations**



■ **In the hold, the bulldozer pushes the stray material into a pile (right) which the orebucket then is able to pick up. Hand clean-up is reduced to a minimum. Saving over the old method is tremendous, both in labor and time**



POWER TO SPARE

but a MISER on fuel..

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Another advantage — and an important one — is the increase in working hours and the decrease in fuel costs these Industrial Brownhoists effect. Most owners figure on two extra hours of work a day over a steam crane; many tell us they save from 25% to 50% on fuel. The combination of the two makes a difference of a good many dollars in the course of a year.

Industrial Brownhoist Diesel cranes are built in capacities of 10 to 50 tons and for all kinds of bucket, hook and magnet work. A new booklet, describing all of them, will be sent you, on request.

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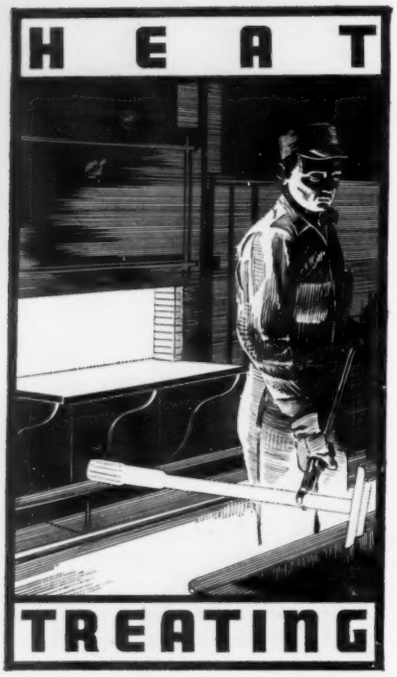
BUCKETS



Liquid Atmospheres

Because of its ease of control, flexibility and economy, the salt bath is gaining new applications in heat treating. Use of carbon as a covering is an aid to improved results

This article was prepared for STEEL by the Research Staff, E. F. Houghton & Co., Philadelphia

■ RESULTS ARE being accomplished today with liquid salt baths in the heat treatment of steel that up to five years ago would have been considered impossible from the standpoint of economy and controllability. Heat treating salts now are available covering the entire range of neutral hardening, annealing, normalizing, drawing, carburizing and high speed steel treatment. Baths can be kept neutral, acid or alkaline, as required.

Liquid baths may be used for a number of reasons including: Uniform means of heat transference, heating without scale or oxidation, clean parts and minimum warping or cracking. In addition, temperature is readily controlled due to heat storage in the bath and consequent "buffering" effect that evens out fluctuations of temperature in the combustion chamber.

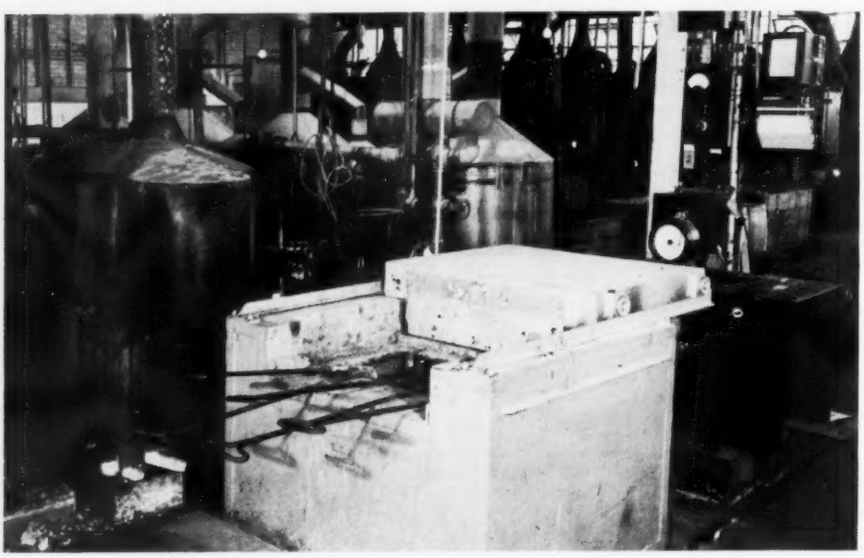
Another characteristic is important on certain types of work. In a salt bath when temperature of the cold part has not come up to the melting point of the salt, there is a slight insulating film of solid salt between the molten salt and the piece of steel. This film is of short duration, because the steel part heats rapidly and the film soon melts. However, it creates a preliminary slow-heating zone — beneficial in the case of large bodies of steel, as it prevents too rapid heating.

At the same time swift, rushing convection currents are created in the liquid salt. These are caused by the temperature difference between the cold piece and the hot salt, for the specific gravity of molten salt varies markedly with any slight change in temperature. This same swift convection flow takes place between the hot wall of the pot and the colder part within the pot.

For continuous production of thousands of small parts, gas carburizing has been adopted by some larger companies, necessitating investments in furnaces and equipment. Many of those same users also have batteries of salt bath pots which afford greater flexibility in dull times when it is costly to heat up large furnaces for limited production. The fluctuation in production during months of comparative inactivity has resulted in this as one advantage of the salt bath method of heat treatment, being much less costly. For carburizing, the liquid method offers uniform depth of case, less time required, less overhead in equipment and minimum distortion.

There are three general temperature classifications under which salt baths are operated: 300 to 1300 degrees Fahr. for drawing or tempering, 1100 to 1800 degrees Fahr. for neutral hardening, case hardening and carburizing, and the 1800 to 2400 degree Fahr. range for high speed steel treatment.

For each class, suitable controllable salts may be obtained to provide the necessary "liquid" atmosphere. It is necessary to use pure



Liquid carburizing in an immersed-electrode type of furnace

REFRACTORY TROUBLE SPOTS IN THE STEEL PLANT

call for "CARBOFRAX"...

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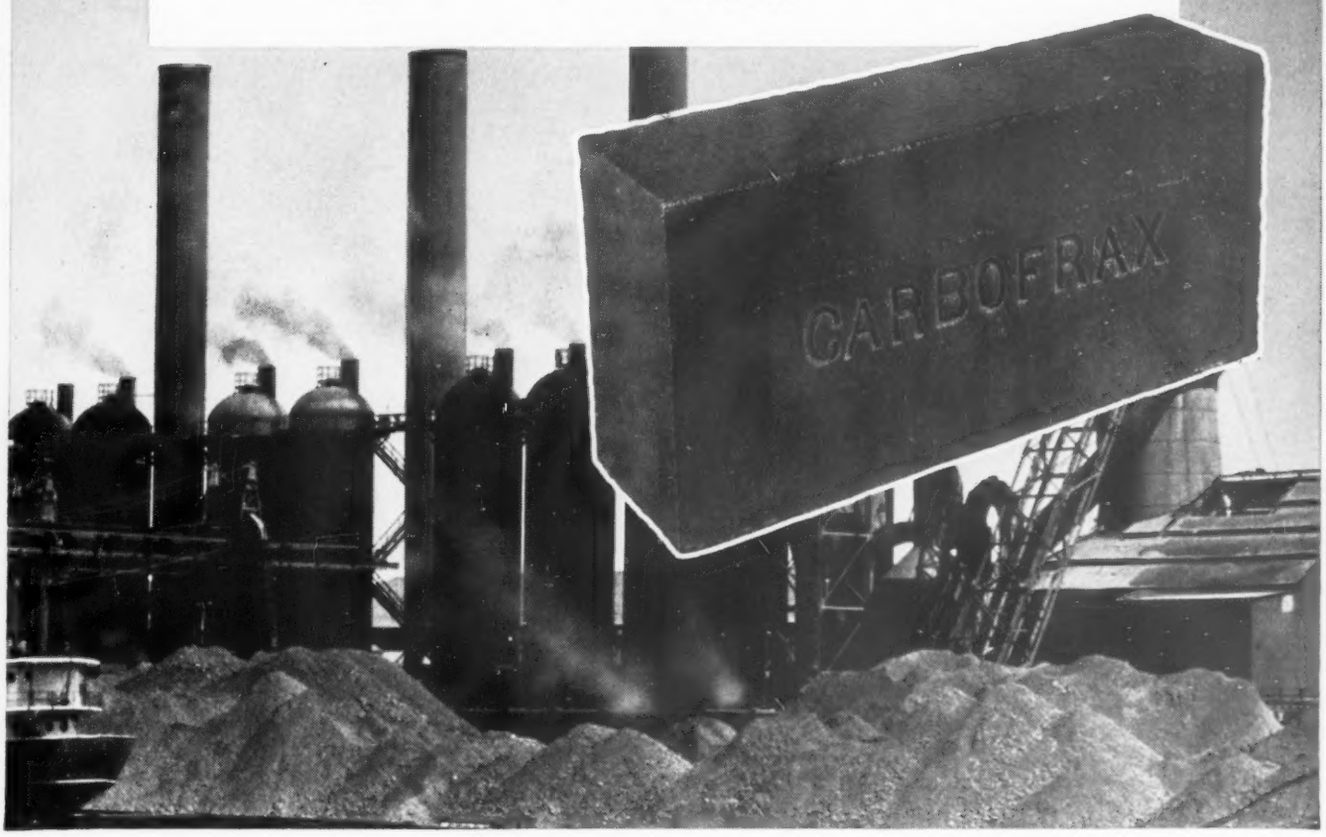

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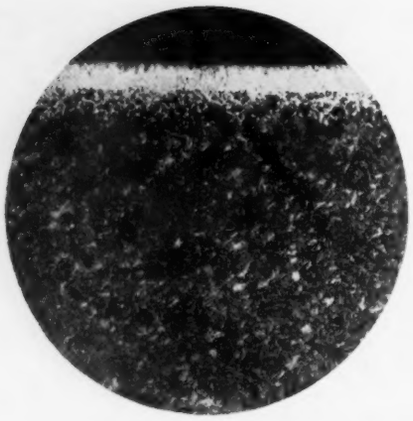


SAE 1085 steel treated in salt over long period at 1650 degrees Fahr. without rectification of bath. Decarburization is evident

salts and to keep them pure. Cleansing or rectification of the bath has been found practical, as in the case of neutral hardening where no carburizing nor decarburizing can be tolerated. This subject of "balanced baths" is a large one in itself, representing years of experience gathered by salt bath manufacturers.

There is one phase of liquid salt baths which deserves further discussion—the covering of the bath with a carbon crust, development of Houghton research. This crust is formed after melting down the salt by pouring in an amorphous granular carbon in amounts varying from 3 to 10 per cent of the salt by volume. It was first developed for Perliton liquid carburizer and has been found to perform two distinct services.

First, the excess carbon keeps the bath constantly charged with carburizing gases held in proper balance. This crust, covered under patents on the process, may be described as a catalytically-charged, surface-active, metal-soluble carbon floating on the surface of the bath. Second, it provides an insulating cover for the bath, reducing surface radiation losses. With a properly formed crust, it is possible to hold one's hand 6 inches above the top of a pot operating at 1600 degrees Fahr.

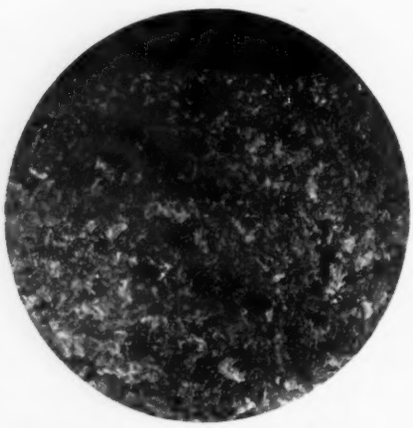
The furnace is insulated on bottom and sides; now the carbon crust insulates the top. Main function of the crust, however, has been overlooked by many concerns who are beginning to use it for its insulation properties only. The ability of the excess carbon to keep the bath rich in true carburizing properties constitutes its principal advantage.

Where work is being treated on a production basis, going in and out of the pot at frequent intervals, a hard crust is not always desired, but a floating layer of carbon is still maintained. Any carbon crust may be easily broken to permit entrance and exit of work; it readily reforms as the pot agitates.

Use Has Spread

Use of this carbon crust has spread to such other salt baths as neutral hardening. A bath formerly not usable above 1700 degrees Fahr. has been found to be effective up to 1800 degrees Fahr. and even above, for the hardening of air-die and other low chromium-tungsten steels, such as are used in header and gripper dies. A layer of this special carbon on top of the bath halts fuming. Previously fuming point of this particular bath was slightly below 1800 degrees Fahr. Effect of carbon in this instance is to prevent oxidation or break-down of the salt. This bath contains no cyanides or carbonates; therefore there is no casing effect.

Thus there are many further possibilities to be studied in salt bath coverings, other than for carburizing as already perfected. Preliminary work in the treatment of high speed steel is opening up another wide vista of work for the salt bath. Its controllability, flexibility in production and economy—all justify its increasing use in industry.



Same SAE 1085 steel, same magnification, treated in a rectified bath cleansed of impurities, neutral. Bath keeps in balance indefinitely

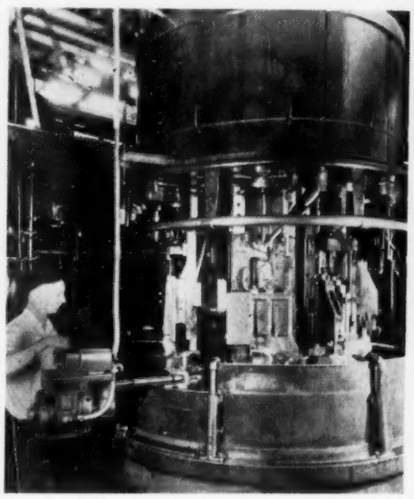
♦

Induction Motors Are Controlled at Low Speeds

■ Squirrel-cage induction motors with an adjustable no-load speed are the result of an attempt to solve a troublesome machine tool problem. The task of tightening the jaws of a chuck to the work on a lathe or tool involves considerable physical effort that should be spared the operator if possible, especially when it is frequently repeated. Other methods of bringing the jaws to the work without shock and holding it firmly have been tried, for example compressed air and hydraulic methods, and were found undesirable from a maintenance and flexibility standpoint.

An ordinary induction motor would come to almost synchronous speed quickly, and the shock on the work and the jaws of the chuck when they come together would be too great. More control over the speed of the motor would be desirable. A novel motor and control was devised by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., which permits an induction motor to be run at light-load at any desired low speed. The idea centered around the loading of the motor internally.

The motor has a 3-phase delta winding, with one phase disconnected from the other two, making



By controlling the current flowing in the reversed third phase of this power wrench of Cushman Chuck Co., Hartford, Conn., chuck pressures can be varied at will from 3000 to 14,000 pounds

it an open-delta motor. When a lower light-load speed is desired the third phase is connected to the line in reverse. The current traveling through it is in a generating instead of motoring direction and tends to buck the motor action of the two open-delta phases. This slows down the motor as though a load had been applied to the motor with a high-resistance rotor. By controlling the current with a rheostat through the reversed phase, bucking action and motor speed can be closely controlled. In effect, this is the same as a power wrench by which the operator can tighten the jaws of the chuck at a speed and with a pressure suitable to the work at hand. This means that work can be handled in the machine more quickly with more uniform results.

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There are two things that are happily married in the finishing industry, and Armco Research means to keep them that way: porcelain enamel, the lovely glass-like finish so popular today, and Armco Enameling Iron, the pioneer base metal in this growing field. To do this successfully, though, requires endless testing, experimenting, and tenacity of purpose. In the new Armco Research Laboratories is complete equipment for the application and testing of porcelain enamel — from milling to firing. Invaluable to regular customers, it can likewise be invaluable to you, if you have a problem in porcelain enameling.

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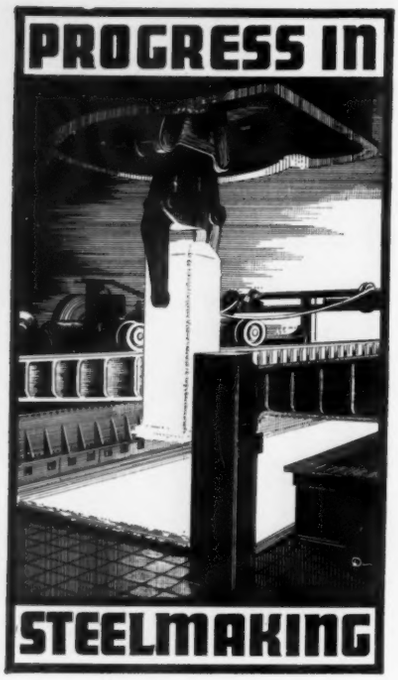


Safety

Mechanical features of any safety program are essential, but human behavior is the factor that requires the major attention and concern in maintenance of steel mills

■ STARTING only 30 years ago, the safety movement in industry has made excellent progress, especially in the metalworking industries which were regarded as extra hazardous at one time.

In the earlier days of the movement, emphasis was placed upon safety guards, enclosures and similar mechanical methods. Decrease in accidents, however, was disappointingly small. When attention was focused on the less tangible factor of human behavior, immediate results were realized.

Mechanical features of any safety program are essential, of course, and must be carried out with all possible care, as close attention to this phase has characterized all successful industrial plant safety programs. Nevertheless, human behavior is the factor which requires the major attention and concern of any safety program, according to C. J. Smith, superintendent of maintenance, Gary works, Carnegie-Illinois Steel Corp., who also expressed the following views at a recent meeting of the National Safety Council:

Steel mill maintenance involves several factors important from the safety angle. Working around all types of equipment in all parts of the plant, a maintenance man is subjected to a greater variety of hazards than the average employe and so should be alert, with a ready recognition of the dangers to himself and fellow workmen. The next essential is that proper tools, in good condition, along with necessary safety equipment such as goggles and footguards, should be provided and used.

By-product gases from blast furnaces are often high in carbon monoxide content, requiring particular attention to safety of operating and maintenance men in all locations where such gas may be encountered as in gas mains, blast furnace stoves, gas washers and engine room basements. Many types of gas detectors are available and should be utilized. They include those reading directly in percentage of carbon monoxide, those giving an alarm when a predetermined concentration is reached and many others. When gas is known to be present, hose masks bringing pure air to the wearer, complete oxygen breathing equipment or carbon monoxide filter units may be used.

These are preventative and must be supplemented by a knowledge of artificial respiration in cases of accidental encounter.

In maintenance work another important step is to inform operating heads that work is being done and to shut down and lock out all control devices so accidental operation will not endanger workmen. Where more than one group of men are working on equipment, each group should attach its own lock directly to the lockout device, so removal of one lock will not take away the protection of the other groups. Where one supervisor is responsible for all groups, one lock is sufficient, if not removed until every man assigned to the job is accounted for.

Working platforms, railings, ap-

Ingot Mold Hot Tops Are Wired

■ Fireclay hot tops for ingot molds are reinforced at some steel plants by tying high tensile, galvanized steel wire around them. Wire is draped around the hot top and drawn up by the wire machine's tension lever with the left hand. Right hand operates the tying handle which ties and cuts wire. Photo courtesy Gerrard Co., Chicago

proaches and warning signs as well as special watchers—all should be considered and provided where required. Good light is essential also for safety in maintenance work. Portable cooling fans may often increase comfort and efficiency of the workmen and minimize hazards inherent in fatigue and discomfort.

A successful safety program emphasizes the necessity of being safety-minded at all times. Fortunately the primary objective of safety is the welfare of the individual and no hedging is necessary in selling the proposition on that basis. A review of accidents to men in a line of similar work is effective. Many men with a pride of accomplishment are easily sold on the idea of excelling as a safety booster. Loyalty to a foreman or superintendent who has indicated a sincere interest in his men's welfare also promotes safety.

Group safety meetings in which all men are asked to discuss and submit suggestions are effective if put on a businesslike basis where every suggestion is written out and disposed of by approval or disapproval with this action brought to the attention of the man or group involved. While this may appear obvious, sustained interest in safety meetings largely depends upon such procedure.

Preventive maintenance is also important. Each foreman should be charged with the responsibility of observing and reporting unsafe practices. It is not sufficient to remove a cause after someone has been injured when one step further in anticipating the accident might have prevented it by eliminating the cause.

Proper discipline is essential, as the successful safety program requires discipline as a deterrent to hazardous practices. Violations of established safe practice should be handled to cure the offender, not make him resentful.

Careful inspection to lessen maintenance work and to remove hazards is another factor of importance, especially in connection with overhead traveling cranes, gantry cranes, trolleys and hoists. As failure of these mechanisms is serious, every precaution must be taken to keep this class of equipment in good repair.

While much of the foregoing may appear obvious, accident experience indicates the obviousness of hazards, and necessary preventive measures come only after the injury has occurred. Both maintenance and safety work depend for success upon continuous care to more or less obvious details.

New Door Frame For Open Hearth

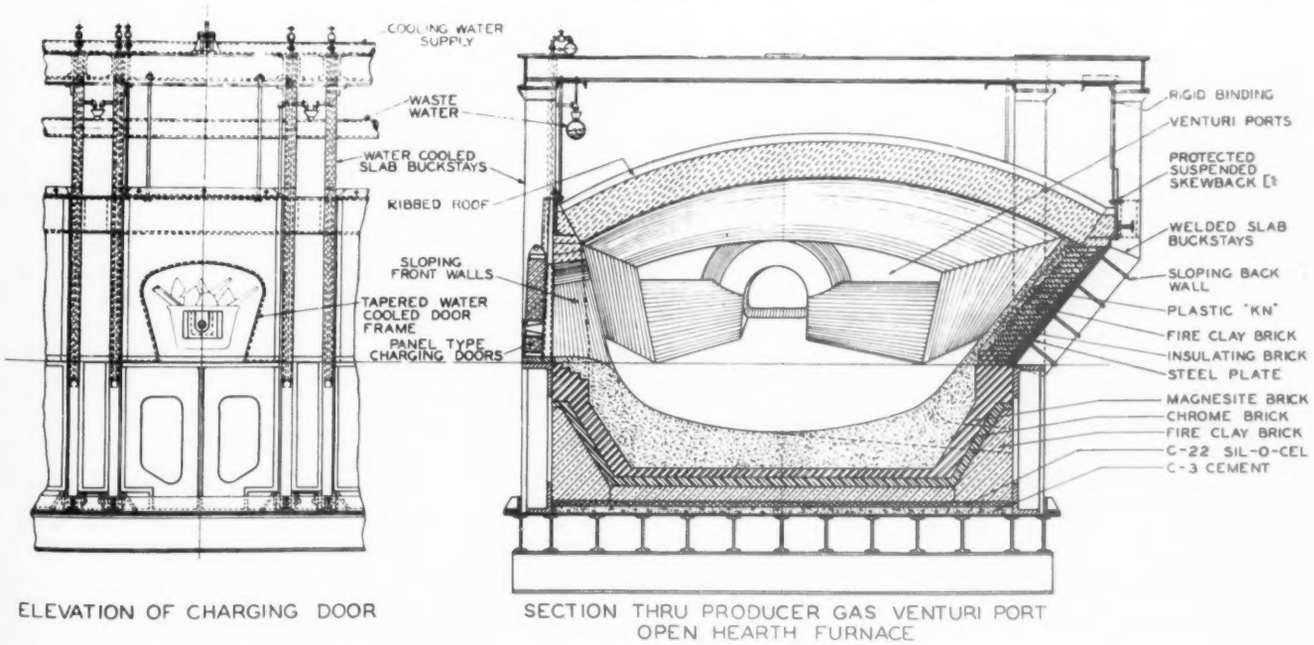
■ A tapered design of water cooled door frame for open hearth furnaces has been developed and patented by Open Hearth Combustion Co., 310 So. Michigan avenue, Chicago. It is manufactured by the Blaw-Knox Co., Pittsburgh.

As shown in the accompanying illustration, legs of the frame are sloped to give an opening at the top considerably wider than at the bottom. The wider top opening is desirable for the furnace charging operation when the materials being charged extend above and beyond the top of the charging box. The narrow bottom opening affords more protection to the furnace men when the door is partially raised for the various operations through the doorway. Also, less labor and material are required to bank the narrow doorway before the liquid iron is poured into the furnace and danger of washing out the bank is minimized.

Legs of frame are sloped to make opening at top considerably wider than at bottom

The sloping legs of the frame permit a wider foundation for the adjoining brickwork, which is correspondingly sloped and, therefore, can be maintained by fettling with the furnace bottom refractories and plastic chrome ore. In this way the principle of the sloping backwall is applied to the frontwall and its life prolonged. Details are shown in the accompanying drawing.

Details of open hearth furnace equipped with new water-cooled door frame



ELEVATION OF CHARGING DOOR

SECTION THRU PRODUCER GAS VENTURI PORT OPEN HEARTH FURNACE

A.S.T.M. Committees Approve New Tests And Specifications, Modify Old Ones

■ MANY new specifications and tests and many changes in existing standards and procedures were approved by committees of the American Society for Testing Materials meeting in Rochester, N. Y., March 7-11, in connection with the society's 1938 Committee Week. More meetings of standing committees, their subgroups and sections, were conducted than in any similar series in previous years, the total number of conferences being something over 165. Actual registration was 662, a new high.

Among the committees holding sessions were a number dealing with iron and steel, nonferrous metals, coal and coke, and gaseous fuels. Recommendations of the committees involving new standards, tentative standards, or changes and modifications in existing standards will be subjected to letter ballot of the committees, then will be referred to the society at its forty-first annual meeting in Atlantic City, N. J., June 27-July 1, for formal approval.

A symposium on plastics with six technical papers was held on March 9, this constituting the society's 1938 regional meeting. Attendance at the two sessions was about 450. The symposium was sponsored by the recently organized committee D-20 on plastics, and it dealt principally with the chemical compositions, physical characteristics and methods of testing the various types of materials.

Following are brief summaries of the more important work performed by various A.S.T.M. committees in the metals and fuels fields:

Committee A-1 on Steel

Subjects of predominating interest were the so-called low-alloy steels and welding. A number of tentative specifications were recommended for adoption as standard and changes are to be made in other specifications. Recommended for adoption are: Structural Nickel Steel (A 8); Seamless Cold-Drawn Alloy-Steel (4 to 6 per cent chromium) Heat-Exchanger and Condenser Tubes (A 187); Seamless Alloy Steel (4 to 6 per cent chromium) Still Tubes for Refinery Service (A 188); Molybdenum Steel Plates for Boilers and Other Pressure Vessels (A 204); Chrome-Manganese-Silicon (CMS) Alloy-Steel Plates for Boilers and Other Pressure Vessels (A 202); Carbon-Silicon-Steel Plates of Ordinary Tensile Ranges for Fusion-Welded Boilers and Other Pressure Vessels (A 201); and Cold-Rolled Strip Steel (A 109).

In structural steel, studies of steel piling, structural bolts and high-strength rivets will continue.

Extensive revisions in the form of a new tentative specification of the standard for normalized, quenched and tempered alloy steel forgings (A 63) are to be recommended. Specifications cover classes of alloy steel forgings used in locomotive and car construction, diesel engines, miscellaneous machinery parts on ships, locks and dams. Physical properties covered by various classes of forgings range from tensile strength of 85,000 to 120,000 pounds per square inch depending upon grades and sizes, with corresponding minimum elongation values in 2 inches ranging from 16 to 25 per cent and a yield point range from 60,000 to 95,000 pounds per square inch. Work on alloy and carbon steel forgings is to improve existing standards.

Revisions for Boiler Tubes

Specifications for lap-welded and seamless steel boiler tubes (A 83) are to be revised to include the new system of indicating wall thicknesses by decimals (with nearest Birmingham wire gage given). Sizes from ½ to 6 inches O. D. and walls from 0.035 to 0.320 are covered. A new system of tolerances by percentages will be inserted. Grade C tubes (medium carbon) are to be covered in a new specification. Tentative specifications for seamless steel boiler tubes for high-pressure service (A 192-36 T) are to be revised to cover material up to 1-inch wall thickness.

Additional studies will be made on standardizing requirements for the three types of spiral pipe now produced. Substantial agreement has been reached on new specifications for carbon-molybdenum steel boiler and superheater tubes, and they are expected to come up for action in June. A separate standard for medium carbon tubes will be developed with maximum carbon of 0.35 per cent, minimum tensile strength of 60,000 pounds per square inch and O. D. size range of ½ to 5 inches, inclusive.

Changes published last year involving scope clauses and chemical composition of high-tensile strength carbon-silicon steel plates up to 2 inches in thickness (A 149) and over 2 to 4 inches in thickness (A 150) were recommended for adoption.

Since recent research in tensile testing has indicated rate of loading is preferable to free crosshead speed as a method of limiting speed in determination of yield point, subcommittees for particular materials are to study applicability of method.

Discussion of utility and extent of use of specifications for commercial bar steels (A 107, hot-rolled; A 108, cold-finished bars and shafting) indicated they serve a distinct purpose and are in considerable use.

Preliminary study of 100 specifications in the charge of Committee A-1 indicate about 50 cover materials which are welded successfully and about 20 others are for material which appear weldable, possibly with minor changes in present requirements. Detailed studies are to be made. Committee is following welding research, particularly to solve questions on the carbon-manganese ratio.

Further studies will be made of specification drafts for welding grades of carbon steel castings and carbon-molybdenum alloy steel castings to be subjected to service at high temperatures, particularly on impurity elements and welding technique. Numerous proposed changes were recommended to be published as tentative in standards for alloy steel castings for valves and fittings for service from 750 to 1100 degrees Fahr. (A 157), lap-welded and seamless steel pipe for high-temperature service (A 106) and forged or welded pipe flanges (A 105).

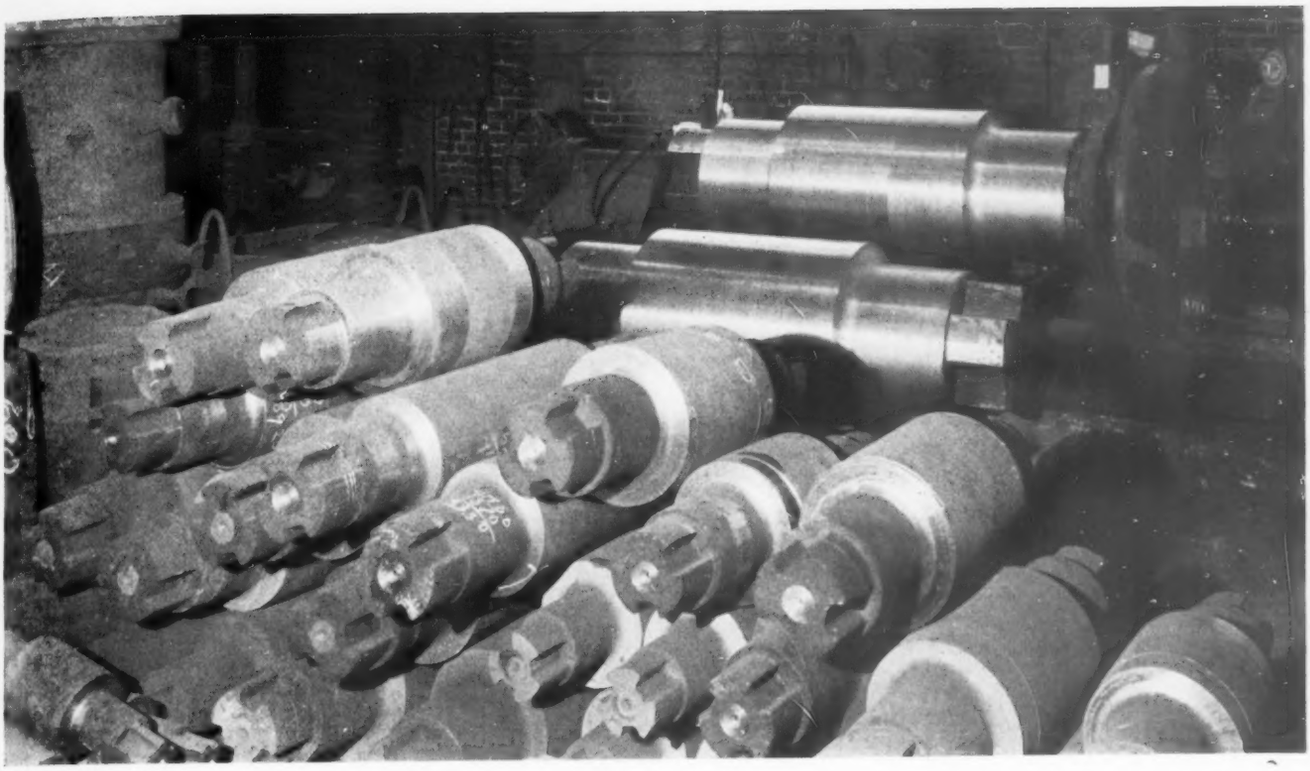
A new class of nut, carbon-molybdenum composition, will be incorporated in the high-temperature nut specifications (A 194), with other proposed modifications. To meet demands for standard material requirements for welded-end fittings, a section is drafting a proposed standard.

Committee A-2 on Wrought Iron

Approved letter ballot for immediate adoption revisions in table of dimensional requirements appearing in Standard Specifications for Welded Wrought-Iron Pipe (A 72-33). The changes will remove butt weld requirements for sizes 2½ and 3 inches from all of the three weight classifications covered by the specifications, since butt weld wrought-iron pipe is not made in these sizes. In the case of double-extra strong pipe, requirement for 1½ inches lap welded pipe will be deleted, since wrought-iron pipe of this size is made only by buttweld process.

Received from subcommittee on wrought iron bars proposed revisions of the Standard Specifications for Staybolt Wrought Iron, Solid (A 84-36) and for the Standard Specifications for Staybolt Wrought Iron, Hollow Rolled (A 86-36) which will provide certain changes covering permissible variations in dimensions. Before final action is taken, matter will be considered by specifications committee of Association of American Railroads.

Will submit to letter ballot a proposed revision in Tentative Specifications for Rolled Wrought-Iron Shapes and Bars



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OVER FIFTY YEARS OF SERVICE TO THE STEEL INDUSTRY

(A 207-37 T) which is intended to clarify section on manufacture to indicate that the shapes, sections and bars shall be direct rolled or rolled from piles made from pig puddled or processed wrought iron and shall be free from any admixture of iron scrap or steel.

Committee A-3 on Cast Iron

Section in charge of pig iron has been reorganized and is investigating specification requirements. Two new subcommittees will cover soil pipe and pressure pipe and a new group will investigate the 2-inch transverse test bar of the 60,000 pounds per square inch class in the Standard Specifications for Gray Iron Castings (A 48-36). Section on white and chilled cast iron held its first meeting at which was outlined a research program to evaluate properties of this class of irons.

Committee A-5 on Corrosion of Iron and Steel

Inspection of the extensive and country-wide outdoor tests have been made throughout the year. These tests include work on bare and galvanized sheets and hardware.

Committee anticipates inspection of corroded specimens in new wire tests in April when first samples will be removed from racks in Pittsburgh. All test stations have been inspected from visual standpoint at least once.

Referee testing, physical and chemical, of all wire test material has been completed by the national bureau of standards; complete data are expected to be published in the 1939 annual committee report.

Proposed new tentative specifications covering galvanized sheets will be recommended for publication as tentative, with probability they eventually will supersede existing standard specifications (A 93-27) which cover sheets with five classes of zinc coatings prepared by hot dipped process.

After approving certain changes in the Method of Test for Uniformity of Coating by the Preece Test (Copper Sulfate Dip) on Zinc-Coated (Galvanized) Iron or Steel Wire (A 191-36 T), method was approved for recommended adoption as standard.

To meet demands for a test procedure for determining thickness of zinc coating on zinc-coated (hot galvanized) irregular shaped hardware, especially steel castings and forgings, and gray iron and malleable iron castings, committee has developed a proposed Preece test procedure and recommended it for publication as tentative.

Discussion made it clear that stripping methods as described in Methods of Determining Weight and Uniformity of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles (A 90-33) should be continued for iron and steel hardware conforming to general description of bolts, nuts, nails, etc., and other parts which have uniform or easily estimated surface areas.

Committee A-7 on Malleable Iron Castings

Principal activity involved work of Prof. Landon of Southern Methodist university on recognition of yield point of malleable iron. Results are expected to be referred to the subcommittee on methods of test shortly. A new subcommittee has been organized to cover welding. A paper is to be prepared by Enrique Touceda, covering quenching temperature in treatment for prevention of galvanizing embrittlement.

Committee A-10 on Iron-Chromium, Iron-Chromium-Nickel and Related Alloys

Subcommittee is collecting and correlating authoritative basic data on chromium and chromium-nickel corrosion-resisting alloy steels, this information including data on chemical, physical, mechanical and fabricating properties of the alloys.

A special committee reported completion of inspections of stainless steel installations on exteriors of Chrysler and Empire State buildings, New York. The information will be supplemented by inspections of stainless steel on smaller buildings. Behavior of corrosion-resisting steels under conditions of service will be correlated with the previous manufacturing history. Results of these surveys should be of assistance to the architectural and engineering professions in connection with future building construction.

Committee reported preparation of draft of recommended procedure for making atmospheric field corrosion tests of stainless steels which was accepted for study.

Subcommittee on metallography reported completion of microscopic examination of 18 per cent chromium, 8 per cent nickel steel after various heat treatments. Two heats containing, respectively, 0.065 and 0.098 per cent carbon, were examined and photomicrographs prepared at 100 and 750 diameters. Data is being studied to determine nature of grain boundary precipitation of austenitic steels of this type.

Subcommittee on specifications for flat products reported revisions in the existing Tentative Specifications for Corrosion-Resisting Chromium-Nickel Steels (Sheet, Strip and Plate) (A 167-35 T). Subcommittee on specifications for tubular products is preparing, with co-operation of American Petroleum institute, proposed specifications for corrosion-resisting chromium-nickel alloy steel seamless still tubes for petroleum refinery installations.

Consideration is to be given to formulation of specifications for chromium and chromium-nickel alloy steel seamless tubes for corrosion-resisting service. Work also will be undertaken on the preparation of specifications for both chromium and chromium-nickel alloy-steel welded stainless tubing.

Committee B-3 on Corrosion of Nonferrous Metals and Alloys

The 1938 annual report will present results of third series of tests on 24 nonferrous metals and alloys exposed in 1931 to various atmospheres at nine test locations. The program contemplates five such tests at intervals over 25-year period. The three sets completed were made after exposure intervals of approximately 1, 3 and 6 years.

In latest tests, extent of corrosion has been determined by same procedure used in the previous tests, namely, by measuring changes in weight of duplicate 9 by 12-inch plate specimens, by visual examination, and by determining changes in tensile strength and per cent elongation of tension test specimens.

Various types of copper alloys, bronzes, aluminum and aluminum alloys, brasses, nickel and nickel alloys, lead, zinc, and their alloys are included. Four plate specimens of each material are exposed at each of the nine test locations; 30 tension test specimens and an extra set of 30 tension specimens was prepared and stored under air-tight conditions at national bureau of standards. The two "removable" plate specimens are returned to the bureau for inspection and weighing. At the same time the exposed tension specimens are tested, six specimens of each material are removed from set in air-tight storage at the bureau and their tensile properties determined. This indicates changes occurring through simple aging.

Various types of atmospheric conditions are represented by test sites at State College, Pa.; Phoenix, Ariz.; Pittsburgh; Altoona, Pa.; Rochester, N. Y.; New York; Sandy Hook, N. J.; Key West, Fla.; and La Jolla, Calif.

Committee B-4 on Electrical-Heating, Electrical-Resistance and Electric-Furnace Alloys

High temperature bend test equipment for testing bars for structural elements of electric furnaces has been developed and given preliminary trial. Tests soon will be under way at 1800 degrees Fahr. with different loads, with a view to developing a standard method of test. Investigation is being made to develop a test for warpage of bars for electric furnace work.

Considerable work has been done in studying the effect of different furnace atmospheres upon the life of electric furnace resistors, and valuable information is being obtained with a view to developing a standard method of test for determining resistor life under such conditions.

Committee B-5 on Copper and Copper Alloys, Cast and Wrought

Approved for submission as a proposed new standard, specifications covering rolled nonferrous bearing and expansion plates, these covering plates used in bridges and other structures for fixed or expansion bearings where motion is slow and intermittent and pressure does not exceed 3000 pounds per square inch. Plates are to be a homogeneous alloy of copper and tin or of copper and silicon and may contain certain other elements. Physical properties provide minimum tensile strength of 65,000 pounds per square inch, minimum brinell hardness of 130 for plates ¼ inch and thicker, and a compression yield strength (0.1 per cent set) of 25,000 pounds per square inch minimum.

New specifications for sheet and strip brasses are to be recommended to replace the existing Standard Specifications for Sheet High Brass (B 36-35). Subject to letter ballot, revisions will be submitted in Tentative Specifications for Bronze Castings for Turntables and Movable Bridges (B 22-36 T) and tentative revisions are being proposed in chemical composition requirements of Specifications for Aluminum-Bronze Castings (B 59-36).

Action was taken to recommend adoption as standard of Specifications for Bronze Castings in the Rough for Locomotive Wearing Parts (B 66-36 T) and for Car and Tender Journal Bearings, Lined (B 67-36 T) and to withdraw existing standards for sand castings of the alloy, 80 copper, 10 tin, and 10 per cent lead, (B 74), and yellow brass sand castings for general purposes (B 65).

In specifications covering manganese bronze ingots (B 7) and sand castings (B 54), two alloys of higher tensile strength and lower elongation in which manganese is used as deoxidizer are under consideration. Committee is working on standardized requirements for nickel-bearing copper alloys which include compositions up to 31 per cent nickel. Another study under way is general regrouping and reclassification of various standards covering casting alloys.

Committee B-6 on Die-Cast Metals and Alloys

Proposed to amplify tentative specifications for zinc-base alloy die castings (B 86-34 T) by addition of a new alloy No. XXV. This alloy, under study several years, is suitable for commercial die castings. It differs in composition from present alloy No. XXI in that copper content is 1 per cent. Physical properties are in between those of present alloys Nos. XXI and XXIII.

Committee received satisfactory progress report concerning studies on five tin-base and lead-base die casting alloys to determine tensile strength, creep, impact resistance and hardness. A set of test specimens has been obtained.

Exposure and corrosion test program,

(*Please turn to Page* 64)

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UNITED STATES STEEL

By ROBERT E. KINKEAD

On this page the author, well-known consulting engineer in welding is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL

Welding Schools In Deplorable State

■ In the current issue of *Mechanical Engineering*, statistics are quoted to the effect that there are 84,547 engineering students registered in 131 institutions in this country. Mechanical engineering leads with 17,803. In some of the more progressive schools welding is taught in the shop courses in the summer along with blacksmithing, bench filing, etc. In a few schools progressive and conscientious professors try to supply the lack by bringing in salesmen for the welding industry to put on conferences and shows of welding equipment. But welding is not treated in any of these institutions as a serious engineering pursuit. That this condition is deplorable is indicated by the information which may be obtained from the back pages of the magazine under the titles, "Men Available" and "Positions Open."

Of 24 men who want jobs, none claim any specific knowledge of welding. Of 7 positions open, five required an engineering knowledge of welding. The welding knowledge required in these jobs is not craftsman's technique but the economics and technical principles of the practice.

Far from suggesting that engineering schools all rush in to supply this field, it is our thought that a great deal of study of the needs of the situation should precede any definite move. We already have too many graduates of too many courses who are not good enough. In the establishment of a welding course some of the blunders of the past should be corrected. A good beginning would be the selection of an educational leader who knows the difference between education and what passes for education as the end product of our system of formal technical training. Unless that fundamental condition can be satisfied, it is probably just as well to leave the matter up to the trade schools. There are many capable teachers in the technical schools who long to escape the futility of conventionalized technical teaching. Selection of the right man for the leader is 50 per cent of the job and it can be done.

Cost of Operators Causes Much Controversy

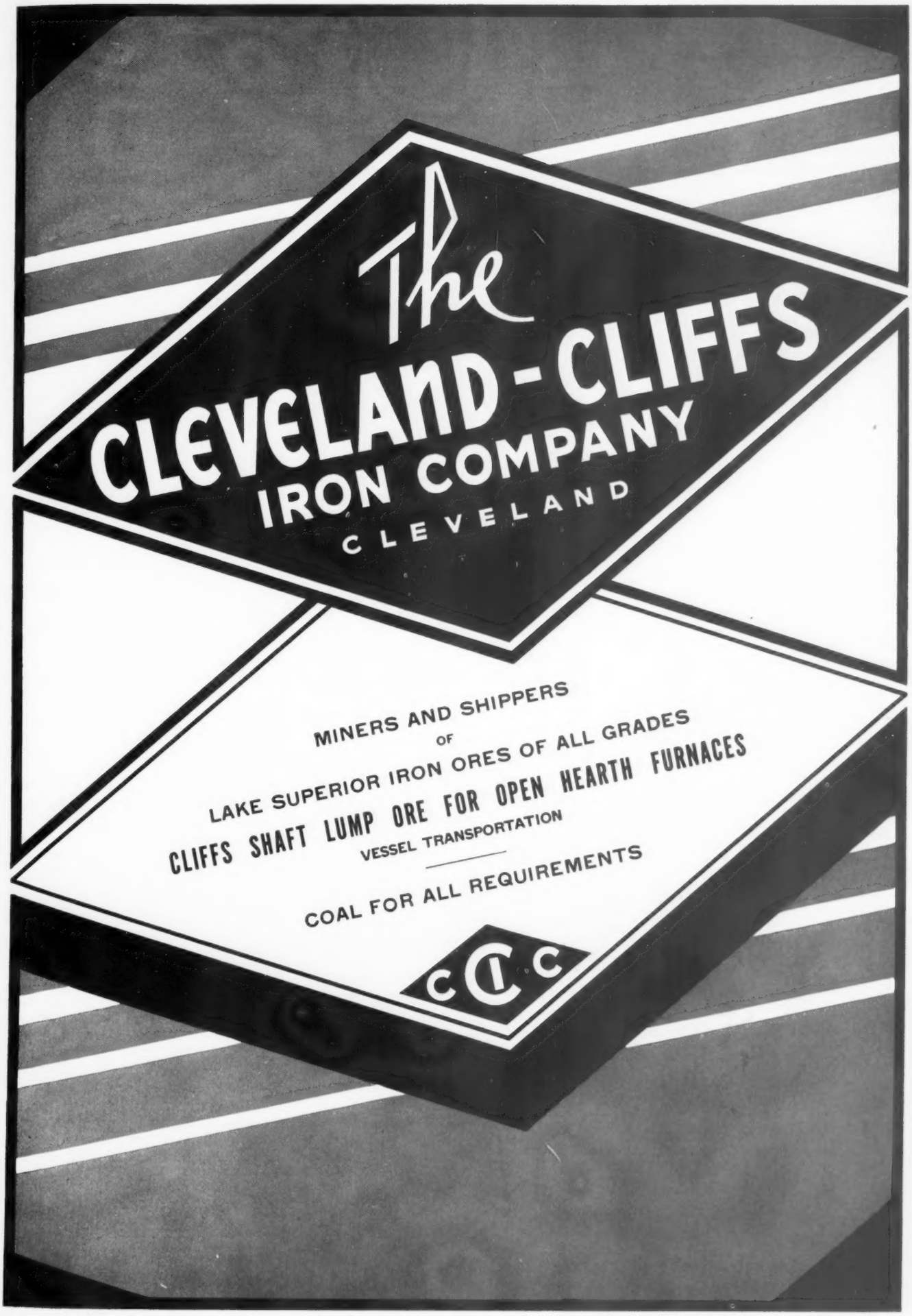
■ A speaker at a welding meeting in Cleveland recently aroused a considerable amount of comment by the statement that his company qualifies about 50 pipe welding operators per year at a cost of approximately $1,500 per operator. The work involved is high pressure steam piping in power plants where the welding has to be done in all positions. The manual skill required is probably greater than in the case of any other commercial welding operation. The responsibility of the welds is very great due to the fact that failure would, in most cases, result in fatalities among power plant operators.

The question of how much may be justified in the way of money expenditures to qualify operators for such welding operations is a source of controversy among welding men. The general tendency is to underestimate what it costs to train men. Too little spent in training simply increases the production cost until they acquire skill on the job so that there are grounds for plenty of argument. For instance, oil producers buy pipe for casings welded and in the ground. One failure due to improperly qualified operators would pay for a good deal of preliminary training. One failure of power plant piping would cost more than proper training for the men.

In the field of production welding where the welds are designed with a large margin of safety, proper training and qualification saves failures and habits which result in high costs. The most casual inspection of any welding department in operation will show many operator's habits which, if corrected, would result in saving costs. It is likely that $1,500 per operator is paid every time either in training or in the consequences of lack of training.

All-Steel Delivery Body

■ **All-steel delivery body built by York-Hoover Body Corp., York, Pa., for use on standard light automotive chassis. The body is equipped with several innovations including a seat which drops out of range of driver operation under the steering wheel when not in use. Doors are of the sliding type and windows float in specially molded rubber frames**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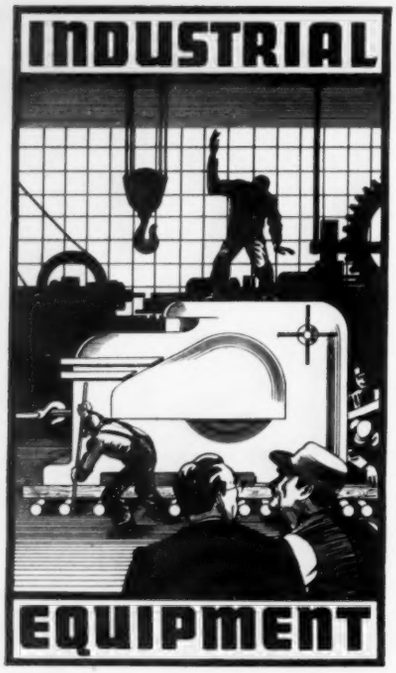


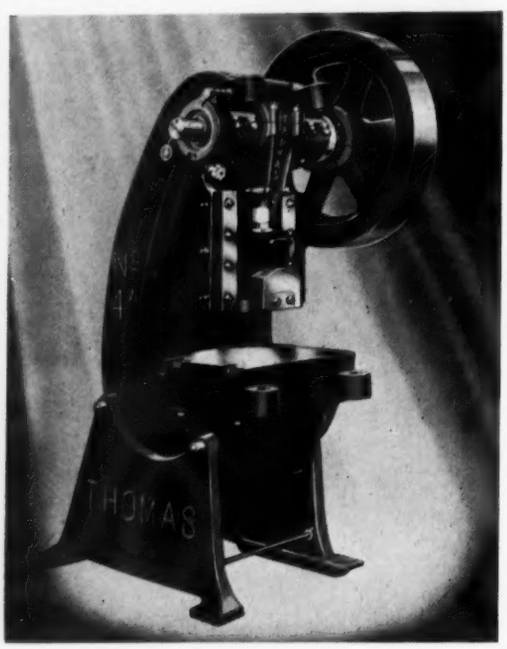
Power Press Slide Has 3-Point Support

■ Thomas Machine Mfg. Co., Pittsburgh, has introduced an inclinable, open back, power press which features a 3-point support for the slide and adequate lubrication for gibs at all points. All wearing parts are adjustable and when necessary they can be easily replaced without remachining the frame, it is claimed.

Slide of alloy metal moves vertically in double 45 degree gibs of hardened steel. Back gibs are bolted to the frame while both the left and right front gibs are adjustable. A hardened steel key is dowled and bolted to the slide and fitted in a slot in the heavy cross member which is cast integral with the frame and extends vertically the entire length of the gibs. Oil reservoirs are cast in the slide at each side and radial outlets are provided at points throughout the gib length. A similar oil channel is provided to lubricate the sliding key at the rear of the slide.

Shaft of the press is of the one-piece eccentric type of rigid design. It is used wherever length of stroke permits. Crankshaft is used for longer strokes. Main bearings are large and of the 45 degree split type, transmitting the thrust directly to the frame. Bushings are of bronze. Unit is also equipped with a safety clutch permitting single stroke non-repeat or continuous operation at the will of the operator. Means are provided for locking the press out of operation when setting dies or making other adjustments. Clutch parts are of alloy steel.

Other features of the press include a flywheel which can be backed up, removable guards, massive one-piece pitman connected with the slide, knockout bar and inclining mechanism.



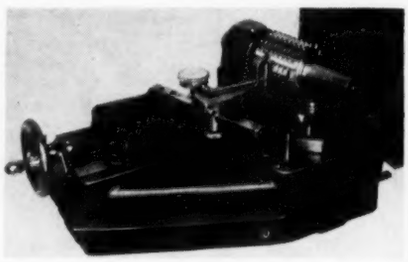
Motor drives of this Thomas inclinable press are available in flat or V-belt types or with the motor pinion geared directly to the flywheel

Contour Checker Locates Gear Errors

■ Michigan Tool Co., Detroit, has placed on the market an improved hob contour checker which is designed for checking hobs in locating possible sources of gear errors in gear analysis work.

The instrument shows any deviations from true pressure angle, down to 0.0001-inch. Another feature of the checker is that it does not require interchangeable angle blocks for checking hobs of different pressure angles. A sine-bar setting also is provided on the checker to take care of different pressure angles.

Indicator is equipped with a multiplication of five to one, so that a movement of the contact finger of 0.0002 inches will register a travel normally representing 0.001 inches on the indicator. This enables registering even such depressions and elevations as are caused by rough grinding. Unit is attractively designed and sturdily constructed.



Hob contour checker built by Michigan Tool Co., shows deviations from true pressure angle down to 0.0001 inches

When not in use, a sheet metal cover is slipped over it to protect it from dust.

Button Controller Has Five Speeds

■ Harnischfeger Corp., 4400 West National avenue, Milwaukee, has developed a compact, P&H push button Master variable speed controller for hoists which features five different speeds.

Controller is so designed that controls for several elements can be incorporated into one push button case. Unit is suspended from hoist by a multi-conductor cable thus eliminating the previously used ropes which were always in danger of becoming entangled.

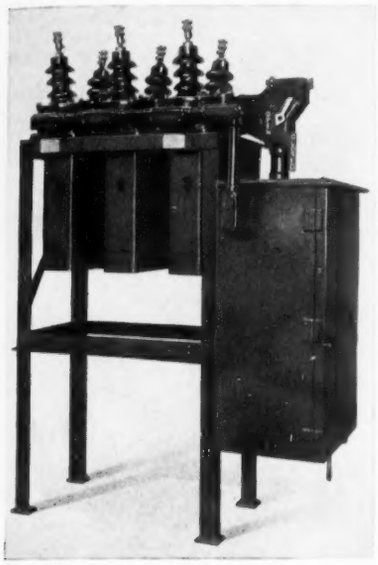
In operating the unit, operator depresses the button which extends through the push button housing. Motor starts slowly and as the operator pushes the button farther, the speed of the motor increases. This is repeated as desired until five speeds are obtained. The control is adaptable to either direct or alternating-current, slip ring motor operation, and can be used on direct-current installations with either low break or dynamic lowering control.

Interrupting Devices Clear Short Circuits

■ Allis-Chalmers Mfg. Co., Conduit Works, Boston, has introduced a type OZ 110 outdoor, oil circuit breaker which is furnished for 600

amperes at 15 kilovolts with an interrupting capacity of 100,000 kilovolt-amperes.

Interrupting devices, called Ruptors, are used to give quick clearing of short circuits, low arc energy, low pressure and minimum oil deterioration. Other features of the circuit breaker include rigid, cast steel, top frames; silver contact surfaces; low inertia, straight-line motion mechanisms; high speed operator; and one-piece, wet process, porcelain bushings. The unit has a weatherproof control cabinet and is arranged for pole or frame mounting.

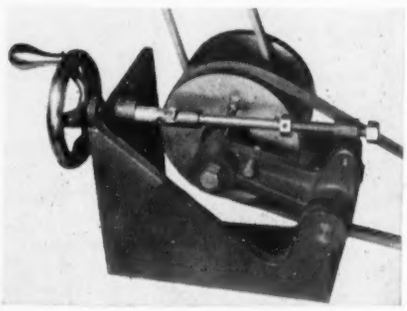


Above is shown an Allis-Chalmers type OZ 110 outdoor, oil circuit breaker which is equipped with Ruptors to clear short circuits

Transmission Unit Controlled by Handwheel

■ Speedmaster division, Continental Machine Specialties Inc., 1301 Washington avenue, Minneapolis, has placed on the market a variable speed transmission which gives a 6 to 1 speed ratio and is installed between the motor and driven machine.

A handwheel which is mounted on the unit controls the speed variations. Unit is built on an angle frame which also serves for mounting purposes. It is driven by V-belts of the Bakelite type which are said to eliminate static electricity. Pulleys may be obtained from 3½ to 6½ inches outside diameter. They are mounted on hardened ground stub shafts and are also equipped with Oilite bearings.



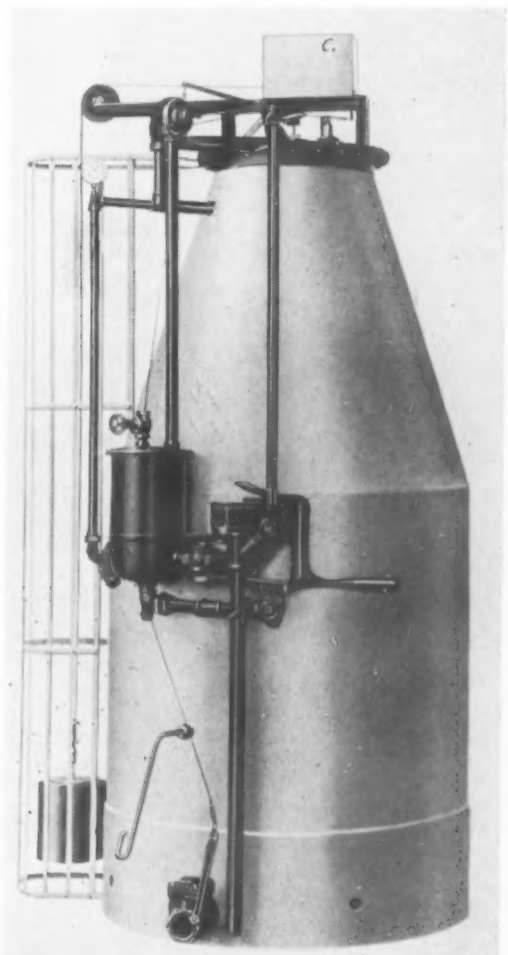
Speedmaster variable speed transmission may be used for fractional horsepower installations or for driving with 4 or 5-horsepower

Acetylene Generator Has Large Delivery

■ Air Reduction Sales Co., 60 East Forty-Second street, New York, has placed on the market double-rated stationary acetylene generators which have a rated delivery capacity from 600 to 1000 cubic feet of acetylene per hour.

The new generator is based on the design of the Airco-DB single-rated type of generator. Shell of the generator is of heavy-gage sheet steel, hot-galvanized inside and out to give maximum protection against corrosion. Pressure control of the unit is located on top where water and lime can not get at it and hinder its efficiency. Feeding does not depend on gravity, the carbide being displaced from a feeding disc. This disc is driven by a gravity motor which in turn is controlled by the pressure control. Pressure control is linked to the governor of the motor in such a manner that failure of the pressure control would stop both the motor and the feeding.

Accuracy of the generator is such that a reducing valve or pressure regulator is unnecessary, it is claimed. Relief valves and other parts are linked so as to eliminate multiplicity of control applications. Generator is fitted with a hydraulic valve, and the hydraulic back-pressure chamber is filled and washed automatically every time the generator is recharged. Unit also is equipped with a mechanical, double-action check-valve which serves as an added protection against a flashback in the line, or any reverse flow which would tend to force water out of the back-pressure chamber. When discharging sludge, it is forced out by the existing pressure in the generator without opening the generator to the air. Thus air is prevented from being drawn in as the water runs out, keeping the air concentration in the generator to a minimum.



In addition to serving as a protection against a flashback in the line or any reverse flow which would tend to force water out of the back-pressure chamber, the mechanical check-valve of this Air Reduction generator also prevents any excess flow of gas such as might result from a break in the line

Committees of A.S.T.M. Approve New Tests, Specifications and Standards

(*Concluded from Page* 58)

formulated last year, is getting under way and it is expected the three zinc-base and four magnesium-base alloys will be placed on exposure racks this summer.

Subcommittee on magnesium-base die-casting alloys reported studies being made on two new magnesium alloys which appear to have desirable properties and further development of which would appear to offer favorable possibilities for die castings. The alloys have approximate composition: Aluminum, 9; zinc, 1; manganese, 0.1 per cent; and aluminum, 6; zinc, 2; manganese, 0.15 per cent, the remainder being magnesium, with usual limitations on impurities.

A paper on Magnesium-Base Alloy Die Castings is in preparation by Dr. J. A. Gann, chief metallurgist, Dow Chemical Co., for inclusion as an appendix to 1938 report.

Committee B-7 on Light Metals and Alloys, Cast and Wrought

Some revisions are to be proposed involving composition of aluminum-base alloys in ingot form for permanent mold castings (B 112). Also in prospect are some modifications in aluminum-base alloy permanent mold castings (B 108). It is expected these will be referred for approval in June.

To incorporate minimum tensile strength requirements covering annealed plate which have been indicated as necessary for purpose of design in boiler and pressure vessel construction, changes are to be recommended in Tentative Specifications for Aluminum Sheet and Plate (B 25-36 T) and Aluminum-Manganese Alloy Sheet and Plate (B 79-36 T).

Changes have been developed in five of the specifications for magnesium-base alloys. In those covering magnesium ingot for remelting (B 93), a forging and a casting alloy are being deleted and three new alloys are to be added: One for casting; one for press forging and bars, rods and shapes; a third for hammered forgings. Specifications for magnesium-base alloy sheet (B 90) are to be amplified by addition of alloy No. 7 which has desirable physical properties and approaches the formability of sheet alloy No. 6. Forging standard (B 91) will be changed by deletion of alloys Nos. 7 and 10, little used today, and addition of No. 15 which has good press forging characteristics and better corrosion resistance. Alloy No. 16 also will be added. This is the best magnesium-hammer forging alloy with physical properties about the same as alloy No. 6, but its salt water corrosion resistance is distinctly better.

Alloy No. 15 will be incorporated in tentative specifications for magnesium-base alloy bars, rods and shapes (B 107). This possesses an excellent combination of physical properties and salt water corrosion resistance and can be heat treated and aged in which condition yield strength is equal to that of the other alloys.

Active work on anodic oxidation of aluminum and aluminum alloys has resulted in proposed new methods of testing anodized aluminum for dielectric strength. It is expected these methods will be submitted for publication as tentative. The subcommittee also is studying abrasion tests of anodized coatings.

In its 1938 annual report, the committee plans to include a paper on "Effects of Methods of Gating on Physical Properties of Aluminum-Alloy Test Bars."

Committee D-3 on Gaseous Fuels

Although no standards were submitted for approval, progress has been made in conducting research on methods of analysis of gases and in determining calorific value and specific gravity of gases. Arrangements have been made with the national bureau of standards for conducting comparisons of different types of apparatus for determining specific gravity. The bureau also is continuing work on study of equipment and methods for metering gas for analytical and testing purposes and will send standard samples of different types of gases to committee member laboratories for comparison of methods of gas analysis.

Preliminary drafts of methods for determining hydrogen-sulphide sulphur and total sulphur in fuel gases have been prepared and submitted to subcommittee on determination of impurities of gaseous fuels.

Next general meeting will be held in conjunction with annual convention of American Gas association in October.

Committee D-5 on Coal and Coke

Approved for presentation to the Society for publication as a tentative standard, a scheme of sampling coals classed according to ash content. This method is intended to apply to average commercial sampling of coal and is designed to give results so that 95 per cent of test results fall within 10 per cent of true ash content of samples. The method also gives instructions for sampling for purposes requiring special accuracy, such as classification of coals by grade or rank and for performance test work. Coals are divided into groups according to size and each group is subdivided according to ash content. For each size and range of ash content, the method specifies minimum number of increments to be taken in collecting gross samples; also minimum weight of each increment is given together with the minimum weight of gross samples.

Approved a revision of procedure for determination of coal ash fusibility, covered in Methods of Analysis of Coal and Coke (D 271), which will permit use of either gas-fired or electrically heated furnaces which meet specified requirements. This revision is necessary because of development in recent years of a number of furnaces suitable for the determination of coal ash fusibility. Furnaces tested and found satisfactory are listed. These, at present, include Denver Fire Clay Co. coal ash fusion furnace, No. 3 melter's furnace of American Gas Furnace Co. and Barrett coal ash fusion furnace.

Subcommittee on plasticity and swelling of coal reported gratifying progress on experimental work to standardize methods for determining swelling or expanding characteristics of coals when carbonized for coke manufacture. Expansion during coking is important in the selection of coals for coke manufacture, as strongly swelling coals cause damage to the coke oven walls. Plans are made for testing different ranks of coking coals by different methods as used in laboratories in this country and Canada. These co-operative tests will be of value in standardization of a suitable method for testing.

Research Committee on Fatigue of Metals

Started a project to study comparison of results of fatigue tests made on different types of testing machines in common use. Two questions needing answers are: Are results from one type of machine the same as those obtained on another? Must a "machine factor" be considered?

Items of interest in the fatigue failures of metals in service were considered. How can the beginning of fatigue fracture (by a spreading crack) be detected? X-ray spectrographs, dying out of vibrations in metals, and change of strength properties of metals before complete fracture were suggested but none of these seems developed to a usable state yet.

A rather marked effect of a magnetic field on fatigue strength of notched bars was reported. Reports were made of tests of full-size riveted and welded joints, and of tests on airplane parts.

Selecting and Buying Tools and Equipment

(*Concluded from Page* 42)

erence for the general-purpose machine equipped with work-holding fixtures designed as single-purpose accessories.

* * * *

■ Supplier's viewpoint on the matter was offered by A. H. d'Arcambal, consulting metallurgist, Pratt & Whitney Co., Hartford, Conn. He pointed to the folly of attempting to save a few dollars on the initial expense of equipment installation at the sacrifice of long-run production costs. He suggested that the primary consideration in selecting new equipment is the accuracy desired in the resulting product.

He made a plea for full co-operation from equipment buyers in supplying necessary product information to the designers and builders of the so-called "master tools of industry." He also cited the importance of gages in the operation of machine tools, giving as an approved definition of a gage "a device for improving quality, facilitating production and reducing costs."

Any new machine can be no more efficient than the cutting tools selected to be used on the process, and hence much importance attaches to the choice of suitable cutting tools.

Five Continuous Operations Combined

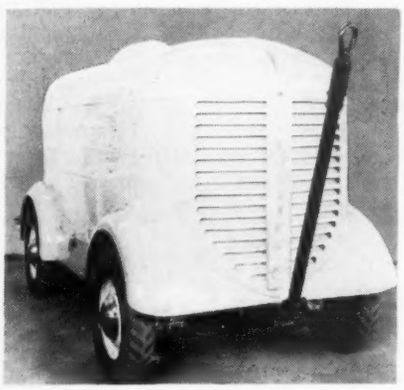
■ An unique method of producing buffing compositions has been developed recently by Bruce Products Corp., Detroit. Bars for polishing and buffing wheels are made more uniform and of higher density by this new method which combines mixing of ingredients, vacuumizing, cooling and forming into one continuous operation with no time interval between successive steps.

This new process is said to improve the characteristics of the compositions so that they in turn produce better results.

NEW METAL PRODUCTS

■ In the form of a lawn edging, steel finds another application in beautifying the landscape. For parks, estates or homes, the edging adds a clean cut, finishing touch to the edges of the lawn that border driveways and walks. It is of 3/16-inch thick strip steel, painted green and with steel stakes 18 inches long to anchor it. Egleston Bros. & Co., Long Island City, N. Y., is the manufacturer.

■ A portable air compressor of up-to-the-minute design is the Air-master, recently brought out by Le Roi Co., 1706 South Sixty-eighth street, Milwaukee. Illustration is of a 160-cubic foot, air-cooled, air com-

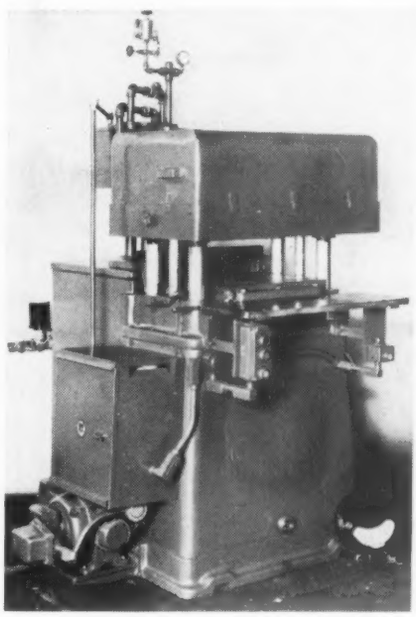


pressor, although 105 and 210-cubic foot sizes are also available. Drive is 4-cylinder Le Roi, water cooled gasoline engine with speed of 872 revolutions per minute. Compressor is 3-cylinder, 2-stage type.

■ Steel chairs of latest design are a new metal product of Harter Corp., Sturgis, Mich. Known as the Cavalier Suite, there are several different models in the new line

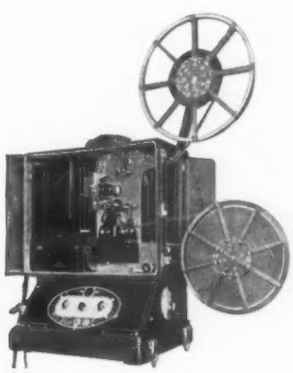
designed to combine comfort and efficiency with simplicity. Chairs are constructed to insure proper weight distribution and correct back support.

■ Reed-Prentice Corp., Worcester, Mass., has announced its No. 50 vertical type, die casting machine for producing stereotype plates used in photographic work, newspaper,



magazine and general printing trade. Of rugged, all metal construction, the new unit has a stereotype size capacity of 11½ x 17 inches and a melting pot capacity of 200 pounds.

■ DeVry Corp., 1111 Armitage avenue, Chicago, has announced improvements in its DeVry Sprocket Intermittent Projector, a unit incorporating the standard 35 mil-

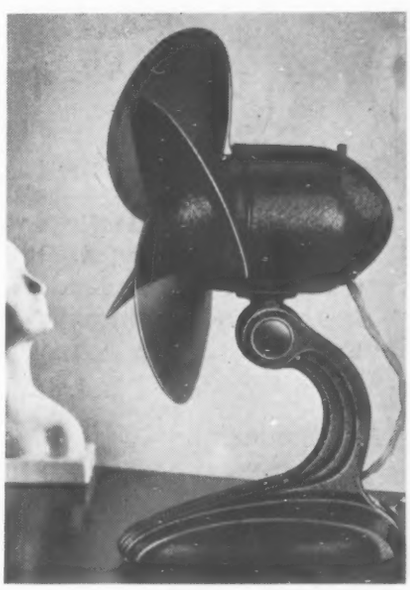


limeter Geneva movement. This machine is claimed to be the only one having the 35 millimeter feature embodied in the 16 millimeter projector.

■ The Streamliner is the name of the latest model range to be introduced by Renown Stove Co., Owosso, Mich. Equipped with standard type oven flues for coal or wood burning,

the cooking top surface area equals the effective area of the average range, although the unit is designed to economize in kitchen space. It has full porcelain inside and out for permanent finish and rustproofing.

■ New fans announced by Samson-United Corp., Rochester, N. Y., include the 10-inch oscillating fan illustrated and the 24-inch circulator fan on floor stand. Both units are



of all metal construction, with the exception of rubber blades, and have crinkle enamel finish.

Better Shipping

(*Concluded from Page* 48)

various ways. For example, one large shipper of metal products is reported reliably to have effected a 20 per cent saving in cost of packing box lumber, 30 per cent saving in weight of boxes with consequent reduction in freight costs, and a 15 per cent reduction in other costs involved in assembling and handling.

Other typical savings which have accrued to manufacturers as a result of a combination of better packing and shipping methods and more intelligent use of materials handling equipment have been featured in various publications in the past two years. Included among these are the following: Saving by unit loading of sheet metal amounting to approximately $122 per carload, STEEL, Nov. 16. 1936; method of speeding shipment of automobile accessories by use of special wirebound skid boxes, STEEL, April 5, 1937; and reduction of $18 per car in cost of unloading zinc, STEEL, April 19, 1937.

In these and many other instances, the indicated economies were expressed only in the difference between previous costs entailed in the specific operations before and after the introduction of the newer methods of packing and shipping. Over and above these specific savings are others, chief among which are customer satisfaction in improved condition of materials at time of receipt and reduction in handling time and effort at both ends of the journey.

Protection of steel sheets from bending, scratching, marring, and other damage incidental to heavy shocks to cars in transit and to exposure to inclement weather has been achieved by shipping departments in the steel industry in recent years. Careful wrapping of sheet packs in waterproof paper and secure binding with steel strapping or wire ties now are common practice. This results in a reduction of damage claims and also gives speedier loading and unloading. Likewise, it contributes greatly to better utilization of storage areas.

♦

Pattern Plates Lighter

■ George F. Pettinos Inc., 1206 Locust street, Philadelphia, has gone into the active production of its new Sonittep Dowmetal pattern plates which are claimed to be lighter and to possess working characteristics to facilitate production, and assist in the manufacture of finer foundry products. The new plates are of magnesium metal and weigh 35 per cent less than aluminum. They also have a tensile strength of 38,000 to 40,000 pounds.

Talks on Carbide Tools

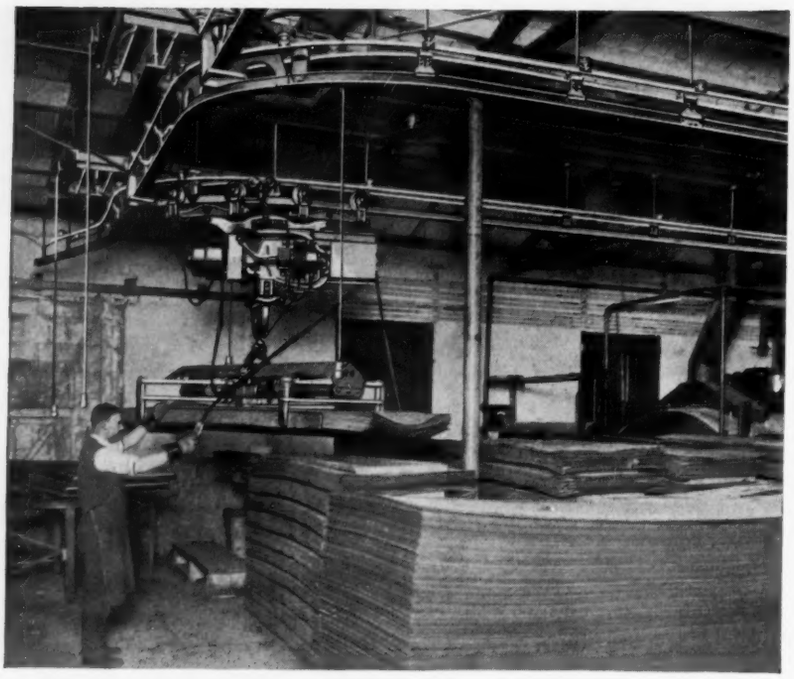
■ Cemented carbide tipped tools should always be kept in motion during grinding, according to L. J. St. Clair, Carboloy Co. Inc., Detroit. In addressing the Bridgeport, Conn., chapter of the American Society of Tool Engineers he set up a number of simple rules to follow in the designing, brazing and grinding of carbide tools.

Among these were: Wheel speeds should be approximately 5000 revolutions per minute, tip should never be dipped in water; top rake should be ground first; only moderate pressure should be used; tools should always be ground against the cutting edge of the tool from tip to shank. In designing tools, the tip should receive maximum support since carbides will not bend but will break if the shank deflects. Carbon tetrachloride was recommended as the best agent in brazing.

CLEVELAND TRAMRAIL

MATERIALS HANDLING EQUIPMENT

For Manual or Motor Operation



● A floor controlled motor operated sheet metal grab is used here for the handling of sheet from the receiving department to the stock piles or directly into the ovens, and then again from the ovens to the punch presses. Notice the almost entire elimination of aisle space at this plant.

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Steel Buying Gains; Heavy Lines More Active

Tin Plate Outlook Good; Rails, Autos Drag; Output Rises

■ CONTINUED slight increase in buying of steel, particularly in heavier lines, gives encouragement, though how much is seasonal and how much business revival is difficult to determine.

Conditions are irregular and some sellers find sales so far in March have exceeded all February. As a whole, conditions are the best of the year to date, with many encouraging signs from business immediately pending or already booked, but not specified. Miscellaneous buying is restricted to immediate needs.

Tin plate producers are in relatively better position than others, with production at about 60 per cent of capacity and indications good for continued activity.

While steel for shipbuilding is piling up an impressive backlog, with more tonnage about to come out, delivery is spread over a considerable period and offers little immediate relief to mills. Steel for Standard Oil tankers recently placed with four yards is delayed while Washington considers design details. These tankers are to serve as navy auxiliaries. Government dredges and tenders are under consideration but closing is delayed. Eight cargo ships for the maritime commission seem near award to two eastern yards after bids have been revised. These will require about 40,000 tons. Sanitary department of New York will ask bids shortly on 30 arc welded steel scows, requiring about 4000 tons of plates.

Structural tonnage gives promise of reaching a fairly heavy total when projects now pending are converted into orders. Close to 60,000 tons are before bidders in lots from 2000 to 20,000 tons. Much of this is for federal and other public work but some private projects are also pending. Placements during the past week include 3092 tons of shapes and 1500 tons of piling for a Mississippi river dam, 1750 for a building for the New York World fair, 1030 tons for a store at Miami, Fla., and 1400 tons for a store at Los Angeles.

Railroad buying since the freight rate announcement has been practically absent. The Chicago, Burlington & Quincy has placed 30,000 tons of rails with several producers and the Western Pacific has ordered 10,930 tons from the Colorado mill. The Burlington purchase also includes about 10,000 tons of track fastenings. Bangor & Aroostook steel-sheathed cars, recently placed, will require more tonnage than regular box cars. Placing of steel for this order is expected within a few days.

Steelworks operations last week rose 2 points to a national rate of 32 per cent. Pittsburgh producers added 4 points, to 30 per cent, Chicago was 2.5 points higher at 30 per cent. Cleveland stepped up 2.8 points to 30.8 per cent and Buffalo 9.5 points to 28 per cent. At only two centers were there reductions in activity, Youngstown receding 2 points to 27 per cent and Cincinnati 7 points to 25 per cent. No change was made at Wheeling at 38 per cent, Eastern Pennsylvania at 29, Birmingham at 61, New England at 15, St. Louis at 37 and Detroit at 33 per cent.

Production of automobiles last week was a close parallel to the preceding week, with 57,555 units, compared with 57,438 the week before. General Motors made 23,860, compared with 24,500, Chrysler 12,975 compared with 13,475, Ford 12,560 compared with 12,060 and other makers 8160 compared with 7403. This week will see a smaller total as part of General Motors production will be down.

Scrap prices seem to be scraping bottom and various adjustments are under way without much change in the general level. For the most part prices are nominal, except where export buying along the Atlantic coast gives some actual insight. Fairly good tonnage is being loaded for European ports. At Pittsburgh steelmaking grades were soft and declined 25 cents and at Chicago there was no change. In Eastern Pennsylvania a wide range developed, giving an advance of 25 cents on the average quotation.

The composite of steelmaking scrap rose 4 cents to $13.25, the second rise this month. The iron and steel composite declined 5 cents to $38.78 and the finished steel indicator remained pegged at $61.70.

Restoration of the import duty on pig iron into Great Britain at the end of March is increasing shipments from Continental ports in the effort to avoid payment.

COMPOSITE MARKET AVERAGES

	Mar. 19	Mar. 12	Mar. 5	One Month Ago Feb., 1938	Three Months Ago Dec., 1937	One Year Ago Mar., 1937	Five Years Ago Mar., 1933
Iron and Steel	$38.78	$38.83	$38.84	$38.90	$38.88	$39.92	$27.92
Finished Steel	61.70	61.70	61.70	61.70	61.70	60.70	45.60
Steelworks Scrap	13.25	13.21	13.13	13.54	13.24	20.95	6.47

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	March 19, 1938	Feb. 1938	Dec. 1937	March 1937
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.40c
Steel bars, Chicago	2.50	2.50	2.50	2.50
Steel bars, Philadelphia	2.75	2.75	2.75	2.74
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	2.35
Shapes, Pittsburgh	2.25	2.25	2.25	2.20
Shapes, Philadelphia	2.465	2.465	2.465	2.455
Shapes, Chicago	2.30	2.30	2.30	2.30
Tank plates, Pittsburgh	2.25	2.25	2.25	2.20
Tank plates, Philadelphia	2.445	2.445	2.445	2.435
Tank plates, Chicago	2.30	2.30	2.30	2.30
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	2.35
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	3.10
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.70
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.45
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	3.25
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.85
Plain wire, Pittsburgh	2.90	2.90	2.90	2.85
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$4.85
Wire nails, Pittsburgh	2.75	2.75	2.75	2.70

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$36.40
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	36.40
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	36.40
Wire rods, No. 5 to 9/32-inch, Pitts.	47.00	47.00	47.00	46.20

Pig Iron

	March 19, 1938	Feb. 1938	Dec. 1937	March 1937
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$24.85
Basic, Valley	23.50	23.50	23.50	23.10
Basic, eastern del. East. Pa.	25.34	25.34	25.34	24.76
No. 2 fdry., Pittsburgh	25.21	25.21	25.21	24.80
No. 2 fdry., Chicago	24.00	24.00	24.00	23.20
Southern No. 2, Birmingham	20.38	20.38	20.38	19.88
Southern No. 2, del. Cincinnati	23.89	23.89	23.89	23.19
No. 2X eastern, del. Phila.	26.215	26.215	26.215	25.635
Malleable, Valley	24.00	24.00	24.00	23.60
Malleable, Chicago	24.00	24.00	24.00	23.20
Lake Sup., charcoal, del. Chicago	30.24	30.24	30.24	28.95
Gray forge, del. Pittsburgh	24.17	24.17	24.17	23.75
Ferromanganese, del. Pittsburgh	107.49	107.49	107.49	90.80

Scrap

Heavy melting steel, Pittsburgh	$13.50	$14.15	$13.40	$22.40
Heavy melt. steel, No. 2, E. Pa.	13.00	13.25	13.13	18.75
Heavy melting steel, Chicago	12.25	12.15	12.40	20.90
Rails for rolling, Chicago	15.25	15.25	14.25	22.25
Railroad steel specialties, Chicago	14.25	14.85	15.75	22.35

Coke

Connellsville, furnace, ovens	$4.25	$4.25	$4.30	$4.05
Connellsville, foundry, ovens	5.25	5.25	5.25	4 25
Chicago, by-product foundry, del.	11.00	11.00	11.00	10.25

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Prices Subject to Quantity Extras and deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.74c
Philadelphia, del.	2.70c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pac. base pts. f.o.b. cars	2.97½c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, delivered	3.49c
Philadelphia, del.	3.45c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pac. base pts. f.o.b. cars	3.82½c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.10c
New York, delivered	4.14c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pac. base pts. f.o.b. cars	4.42½c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.00c
Gary	3.10c
Detroit, delivered	3.21c
Philadelphia, del.	3.30c
New York, del.	3.34c
St. Louis, del.	3.23c
Granite City, Ill.	3.20c
Pac. base pts. f.o.b. cars	3.62½c

Cold Rolled No. 20

Pittsburgh	3.45c
Gary	3.55c
Detroit, delivered	3.66c
Philadelphia, del.	3.75c
New York, del.	3.79c
St. Louis	3.68c
Granite City, Ill.	3.65c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Waste-waste, 2.80c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.54c
Philadelphia, del.	2.44½c
Boston, delivered	2.66c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific basing points, f.o.b. cars	2.82½c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46½c
New York, del.	2.51¼c
Boston, delivered	2.64¼c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo	2.35c
Gulf Ports	2.66c
Birmingham	2.40c
Pacific coast basing pts., f.o.b. cars	2.82½c
St. Louis, del.	2.52c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific coast basing pts., f.o.b. cars	3.02½c
Philadelphia, del.	2.75c
Boston, delivered	2.86c
New York, del.	2.79c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo	2.40c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.45c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.50c
Gulf ports	2.85c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.75c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.30c
Chicago, Buffalo, Cleveland, Birm., Young.	2.35c
Gulf ports	2.80c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	.74
Single loop bale ties, (base C. L. column)	.63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Galvanized wire	2.95c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.

Spring wire, Pitts. or Cleveland	3.50c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars, Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 3.00c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	0.15
6100 bars	1.20
6100 spring	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot-rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23½-in. Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.61c
Philadelphia, del.	2.70c
New York, del.	2.74c
Cooperage hoop, Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.41c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	4.30c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	2.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plate, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.: ⅛ to ⅞-inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75	off

Cut Nails

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts, Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch, lap weld	59½
12-inch, lap weld	58½

Butt Weld

Iron

	Blk.	Galv.
¾	25	7
1 and 1¾	29	13
1½	33	15½
2	32½	15

Lap Weld

1½	23½	7
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2"OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.20-58.20
6 to 24-in., Chicago	54.20-55.20
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-*inch base; gross ton*

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

6 x 6 *to* 9 x 9-*in., base*

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to 9/32-inch incl.	47.00
Do., over 9/32 to 11/64-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.00- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.63

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls. to jobbers	7.25c
Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia	$29.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	.....	24.66	.....
Boston from Birmingham	26.57	.....	26.07	.....
Boston from Everett, Mass.	26.30	26.80	25.80	27.30
Boston from Buffalo	26.45	26.95	25.95	27.45
Brooklyn, N. Y., from Bethelehem	27.47	27.97	.....	.....
Brooklyn, N. Y., from Bmghm.	27.25	.....	.....	.....
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	24.42	.....	23.30	.....
Cincinnati from Hamilton, O.	24.27	25.11	24.61	.....
Cincinnati from Birmingham	23.89	.....	22.89	.....
Cleveland from Birmingham	24.32	.....	23.82	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.10	27.10	26.60	27.60
Newark, N. J., from Birmingham	26.21	.....	.....	.....
Newark, N. J., from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham	25.58	.....	25.46	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....
Pittsburgh district from Neville Island	Neville, base plus 63c, 76c, and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95
St. Louis, northern	24.55	24.55	24.05	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	26.08	26.08	.....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phil. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.24
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80
New Jersey	51.00

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$20.00
Do., for barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd.	$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.49
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot	33.00
Do., New Orleans	33.00
Do., 26-28%, Palmerton	39.00
Ferrosilicon, 50% freight allowed, c.l.	69.50
Do., ton lot	80.50
Do., 75 per cent	126.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	106.50
2% carbon 111.50; 1%,	121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	1.95-2.00
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod-plant, frt. all., net ton	142.50
Contract, ton lots	145.00
Spot, ton lots	150.00
Ferrophosphorus, per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb. f.o.b. mill	0.95
Molybdate, lb. cont. f.o.b. mill	0.80
Technical molybdenum trioxide, 53 to 60% molybdenum, f.o.b. mill	0.80

†Carloads. Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper—Electro, del. Conn.	Copper—Lake, del. Midwest	Copper—Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead New York	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony American Spot, N. Y.	Nickel Cathodes
Mar. 12	10.00	10.12½	9.52½	40.87½	41.20	4.50	4.35	4.50	20.00	13.75	35.00
Mar. 14	10.00	10.12½	9.52½	41.00	41.25	4.50	4.35	4.25	20.00	13.75	35.00
Mar. 15	10.00	10.12½	9.52½	41.75	42.00	4.50	4.35	4.25	20.00	13.75	35.00
Mar. 16	10.00	10.12½	9.52½	41.37½	41.65	4.50	4.35	4.25	20.00	13.75	35.00
Mar. 17	10.00	10.12½	9.52½	41.37½	41.60	4.50	4.35	4.25	20.00	13.75	35.00
Mar. 18	10.00	10.12½	9.52½	41.12½	41.30	4.50	4.35	4.25	20.00	13.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.00c *Conn. copper*

Sheets

*Yellow brass (high)	16.37½
Copper, hot rolled	18.12½
Lead, cut to jobbers	7.75
Zinc, 100-lb. base	10.00

Tubes

*High, yellow brass	19.12½
Seamless copper	18.62½

Rods

*High yellow brass	12.37½
Copper, hot rolled	14.62½

Anodes

Copper, untrimmed	15.37½

Wire

*Yellow brass (high)	16.62½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

*New York	5.75-6.00
Cleveland	6.25-6.50
*Chicago	5.75-6.00
*St. Louis	5.50-5.75

Heavy Copper and Wire

New York, No. 1	6.75-7.12½
Cleveland, No. 1	7.25-7.50
*Chicago, No. 1	7.37½-7.62½
*St. Louis	7.00-7.50

Composition Brass Borings

*New York	4.75-5.00

Light Copper

*New York	4.75-5.00
Cleveland	5.50-5.75
*Chicago	5.50-5.75
*St. Louis	5.00-5.25

Light Brass

Cleveland	3.00-3.25
Chicago	3.62½-3.87½
St. Louis	3.50-4.00

Lead

New York	3.50-3.75
Cleveland	3.00-3.25
Chicago	3.00-3.25
*St. Louis	2.37½-2.62½

Zinc

New York	1.87½-2.00
Cleveland	1.75-2.00
*St. Louis	1.87½-2.12½

Aluminum

Borings, Cleveland	5.75-6.00
Mixed cast, Cleve.	8.75-9.00
Clips, soft, Cleve.	12.25-13.00
Mixed cast, St. L.	8.50-8.75

SECONDARY METALS

Brass, ingot, 85-5-5-5, lcl.	10.25
Stand. No. 12 alum.	16.00-16.50

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-In. & Over	Structural Shapes	Floor Plates	Sheets Hot Rolled No. 10	Sheets Hot Roll Ann. No. 24	Sheets Galv. No. 24
Boston	4.20c	4.40c	5.40c	4.08c	4.07c	5.73c	4.15c	4.90c	5.10c
New York (Metropolitan)	4.12	4.32	4.32	4.00	3.97	5.60	4.07	4.50	5.00
Philadelphia	4.00	4.10	4.35	3.90	3.90	5.25	4.00	4.65	4.90
Baltimore	4.00	4.20	4.45	3.90	3.90	5.50	3.95	4.50	4.70
Norfolk, Va.	4.15	4.35	4.60	4.05	4.05	5.65	4.10	4.70	5.35
Buffalo	3.90	4.22	4.22	3.92	3.80	5.52	3.97	4.80	5.35
Pittsburgh	3.80	4.00	4.00	3.70	3.70	5.30	3.75	4.50	5.15
Cleveland	3.75	4.16	4.16	3.86	3.86	5.46	3.91	4.66	5.31
Detroit	3.935	4.185	4.185	3.95	3.95	5.55	3.935	4.685	5.40
Cincinnati	4.05	4.25	4.25	3.95	3.95	5.55	4.00	4.75	5.40
Chicago	3.85	4.10	4.10	3.75	3.75	5.35	3.85	4.60	5.25
Minneapolis	4.10	4.35	4.35	4.00	4.00	5.60	4.10	4.75	5.25
Milwaukee	3.96	4.21	4.21	3.86	3.86	5.46	3.96	4.71	5.36
St. Louis	4.09	4.34	4.34	3.99	3.99	5.59	4.09	4.84	5.49
Kansas City	4.34	4.59	4.59	4.24	4.24	5.84	4.10	4.85	5.50
Memphis	4.31	4.51	4.51	4.21	4.21	5.85	4.26	5.01	5.66
Chattanooga	4.21	4.41	4.41	4.11	4.11	5.91	4.16	4.06	4.66
Tulsa, Okla.	4.79	5.04	5.04	4.69	4.69	6.29	4.79	5.54	6.19
Birmingham, Ala.	3.85	4.05	4.05	3.75	3.75	5.96	3.80	4.55	5.20
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	4.75	5.15
Houston, Tex.	3.75	6.15	6.55	4.25	4.25	6.15	4.50	5.25	5.65
Seattle	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.35	5.90
Portland, Oreg.	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.15	5.90
Los Angeles	4.30	4.80	6.55	4.30	4.30	6.20	4.50	5.00	5.25
San Francisco	4.20	4.80	6.50	4.05	4.05	5.55	4.30	5.15	5.55

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars 2300	SAE Cold Drawn Bars 3100
Boston	3.845c	4.65c	4.50c	7.97c	6.52c	6.27c	8.37c	8.97c	7.52c
New York	3.92	4.57	4.32	7.82	6.37	6.12	9.52	9.00	7.55
Philadelphia	3.88	4.53	4.25	....	....	....	9.49	....	....
Baltimore	....	4.50	4.15	....	....	....	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.79	4.35	4.10	7.60	6.15	5.90	8.00	8.60	8.15
Pittsburgh	....	4.15	3.95	7.70	6.25	8.50	9.10	8.70	7.25
Cleveland	3.60	4.30	3.95	7.78	6.33	6.33	8.18	8.60	7.15
Detroit	3.78	4.30	4.085	7.89	6.44	6.19	7.74	8.88	7.43
Cincinnati	....	4.50	4.07	7.91	6.46	6.21	9.31	8.92	7.47
Chicago	3.87	4.30	4.05	7.60	6.15	5.90	8.00	8.60	7.15
Minneapolis	....	4.77	4.25	7.95	6.50	8.97	9.57	9.17	7.72
Milwaukee	....	4.41	4.16	7.81	6.36	6.11	8.21	8.81	7.36
St. Louis	3.96	4.54	4.29	7.94	6.49	6.24	8.34	8.94	7.49
Kansas City	4.37	4.79	....	....	....	....	....	....	....
Memphis	....	4.80	....	....	....	....	....	....	....
Chattanooga	....	4.86	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.24	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.85	6.05	....	8.00	8.00	8.65	....	....
Portland, Oreg.	....	5.85	5.85	9.00	8.00	7.85	8.70	....	....
Los Angeles	5.96	6.85	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	9.30	6.80	5.20	3.65	3.80	3.65	3.30	10.65	9.80

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, March 17

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$28.58 5 15 0	$18.09	2 5 0
Basic bessemer	....	....	....
Hematite, Phos. .03-.05	32.31 6 10 0*	17.89	2 4 6
Billets	$39.14 7 17 6	$43.22	5 7 6
Wire rods, No. 5 gage	56.04 11 5 6	40.20	5 0 0
Standard rails	$50.32 10 2 6	$46.23	5 15 0
Merchant bars	2.61c 11 15 0	1.90c	5 5 0
Structural shapes	2.36c 10 12 6	1.77c	4 17 6
Plates, †¼ in. or 5 mm.	2.57c 11 11 3	2.23c	6 2 6
Sheets, black, 24 gage or 0.5 mm.	3.11c 14 0 0	2.82c	7 15 0*
Sheets, gal., 24 ga., corr.	3.72c 16 15 0	3.45c	9 10 0
Bands and strips	2.94c 13 5 0	1.82c	5 0 0
Plain wire, base	4.33c 19 10 0	2.23c to 2.64c	6 2 6 to 7 5 0
Galvanized wire, base	5.16c 23 5 0	2.85c to 2.95c	7 17 6 to 8 2 6
Wire nails, base	4.11c 18 10 0	2.54c to 2.72c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 5.59 1 2 6	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$27.09	5 9 0(a)	$17.41	563.50	$21.91	650	$25.31 63
Basic bess. pig iron	24.85	5 0 0(a)	.....	.....	.....	...	27.92 (b) 69.50
Furnace coke	8.08	1 12 6	5.84	189	7.25	215	7.63 19
Billets	39.14	7 17 6	25.96	840	32.35	960	38.76 96.50
Standard rails	2.25c	10 2 6	1.61c	1,150	2.06c	1,375	2.38c 132
Merchant bars	2.54c	11 9 0	1.51c	1,080	1.65c	1,100	1.98c 110
Structural shapes	2.45c	11 0 6	1.48c	1,055	1.65c	1,100	1.93c 107
Plates, †¼-in. or 5 mm.	2.60c	11 14 3	1.89c	1,350	2.06c	1,375	2.29c 127
Sheets, black	3.50c	15 15 0§	2.19c	1,565‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	4.11c	18 10 0	3.15c	2,250	4.50c	3,000	6.66c 370
Plain wire	4.33c	19 10 0	2.32c	1,660	2.48c	1,650	3.11c 173
Bands and strips	2.71c	12 4 0	1.69c	1,210	2.32c	1,550	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed.

**Gold pound sterling carries a premium of 65.2 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	10.00
Birmingham, No. 2	9.00
Bos. dock No. 1 exp.	13.00
N. Eng. del. No. 1	12.50
Buffalo, No. 1	12.50-13.00
Buffalo, No. 2	10.50-11.00
Chicago, No. 1	12.25-12.50
Cleveland, No. 1	11.50-12.00
Cleveland, No. 2	10.50-11.00
Detroit, No. 1	8.00- 8.50
Eastern Pa., No. 1	14.00-15.00
Eastern Pa., No. 2	12.00-13.50
Federal, Ill.	11.00-11.50
Granite City, R. R.	12.50
Granite City, No. 2	11.00-11.50
Los Angeles, No. 1	12.00
Los Angeles, No. 2	10.50
New York, No. 1	†11.00
N. Y. dock No. 1 exp.	12.50
Pitts., No. 1 (R. R.)	14.25-15.25
Pitts., No. 1 (dlr.)	13.25-13.75
Pittsburgh, No. 2	12.50-13.00
St. Louis, R. R.	12.00-12.50
St. Louis, No. 2	11.00-11.50
San Francisco, No. 1	10.00
Seattle, No. 1	8.00
Toronto, dirs. No. 1	10.00
Valleys, No. 1	13.25-13.75

COMPRESSED SHEETS

Buffalo, dealers	10.50-12.00
Chicago, factory	11.00-11.50
Chicago, dealer	10.00-10.50
Cleveland	11.00-11.50
Detroit	9.75-10.25
E. Pa., new mat.	14.00-15.00
E. Pa., old mat.	9.50-10.00
Los Angeles	14.50-16.50
Pittsburgh	13.25-13.75
St. Louis	6.75- 7.25
Valleys	12.00-12.50

BUNDLED SHEETS

Buffalo	11.50
Cincinnati, del.	8.50- 9.00
Cleveland	8.00- 8.50
Los Angeles	11.50-14.50
Pittsburgh	12.50-13.00
St. Louis	6.00- 6.50
Toronto, dealers	7.00

SHEET CLIPPINGS, LOOSE

Chicago	7.25- 7.75
Cincinnati	4.50- 5.00
Detroit	6.00- 6.50
† Los Angeles	4.00
St. Louis	5.00- 5.50

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	17.50-18.00
Chicago (3 ft.)	15.00-15.50
Chicago (2 ft.)	15.50-16.00
Cincinnati, del.	16.50-17.00
Detroit	14.50-15.00
Los Angeles	18.00-22.00
Pitts., 3 ft. and less	17.50-18.00
St. Louis, 2 ft. & less	15.00-15.50

STEEL RAILS, SCRAP

Boston district	†11.00
Buffalo	15.50-16.00
Chicago	12.00-12.50
Cleveland	16.00-16.50
Pittsburgh	15.25-15.75
St. Louis	12.00-12.50
Seattle	10.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston, district	†8.25- 8.50
Buffalo	10.50-11.00
Chicago, net	8.50- 9.00
Cincinnati, dealers	6.50- 7.00
Detroit, net	7.50- 8.00
Eastern Pa.	12.50-13.00
New York, fdry.	†8.00- 8.50
St. Louis	8.00- 8.50
Toronto, deal'rs, net	9.00

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	16.50-17.00
Chicago, leaf	15.00-15.50
Eastern Pa.	17.00-17.50
Pittsburgh	17.50-18.00
St. Louis	14.00-14.50

ANGLE BARS—STEEL

Chicago	14.00-14.50
St. Louis	13.00-13.50

RAILROAD SPECIALTIES

Chicago	14.00-14.50

LOW PHOSPHORUS

Buffalo, crops	17.00-17.50
Cleveland, crops	19.50-20.50
Eastern Pa., crops	18.50-19.00
Pittsburgh, crops	17.50-18.50

FROGS, SWITCHES

Chicago	12.00-12.50
St. Louis, cut	12.00-12.50

SHOVELING STEEL

Federal, Ill.	10.75-11.25
Granite City, Ill.	11.00-11.50
Los Angeles (net)	16.00-18.00
Toronto, dealers	8.00

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Chicago, No. 1 net	9.50-10.00
Cincinnati, No. 2	9.00- 9.50
Eastern Pa., No. 1	15.50-16.00
St. Louis, No. 1	8.50- 9.00
St. Louis, No. 2	12.00-12.50
Toronto, No. 1 dlr.	16.00

SPECIFICATION PIPE

Eastern Pa.	14.00-14.50
New York	†9.00- 9.50

BUSHELING

Buffalo, No. 1	10.50-11.00
Chicago, No. 1	10.75-11.25
Cincin., No. 1, deal.	7.50- 8.00
Cincinnati, No. 2	3.00- 3.50
Cleveland, No. 2	7.50- 8.00
Detroit, No. 1, new	8.00- 8.50
Valleys, new, No. 1	12.00-12.50
Toronto, dealers	7.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Buffalo	6.25- 6.75
Chicago	6.00- 6.50
Cincinnati, dealers	3.50- 4.00
Cleveland	6.50- 7.00
Detroit	4.50- 5.00
Eastern Pa.	7.00- 7.25
Los Angeles	4.00- 8.00
New York	†3.50
Pittsburgh	7.00- 7.50
St. Louis	4.50- 5.00
Toronto, dealers	7.00
Valleys	9.50-10.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†1.85
Buffalo	6.50- 7.00
Cincinnati, dealers	3.00- 3.50
Cleveland	7.50- 8.00
Detroit	4.50- 5.00
Eastern Pa.	6.50- 7.00
New York	†4.50- 5.00
Pittsburgh	6.00- 6.50
Toronto, dealers	7.50

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem.	†7.50- 8.00
Bos. dist. for mills	†7.00- 7.50
Buffalo	6.50- 7.00
Chicago	5.25- 5.75
Cincinnati, dealers	3.00- 3.50
Cleveland	7.50- 8.00
Detroit	4.50- 5.00
E. Pa., chemical	12.00-13.00
New York	†4.50- 5.00
St. Louis	5.00- 5.50
Toronto, dealers	7.50

PIPE AND FLUES

Cincinnati, dealers	6.50- 7.00
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	9.00- 9.50
Chicago, net	8.50- 9.00
Cincinnati	6.00- 6.50
Eastern Pa.	12.50-13.00
New York	†8.50- 9.00
St. Louis	9.00- 9.50

FORGE FLASHINGS

Boston district	†7.00
Buffalo	10.50-11.00
Cleveland	11.00- 11.50
Detroit	7.50- 8.00
Los Angeles	9.00
Pittsburgh	12.75-13.25

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.00-15.50

ARCH BARS, TRANSOMS

St. Louis	14.00-14.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	12.00-12.50
Chicago, elec. fur.	11.50-12.00
Eastern Pa.	12.50-13.00
St. Louis	8.00- 8.50
Toronto	8.00

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	16.00-16.50
Boston district	†14.00
Chicago, net	17.00-17.50
Eastern Pa.	21.50-22.50
St. Louis	17.50-18.00

SHAFTING

Boston district	†14.00
New York	†15.00-15.50
Eastern Pa.	19.00-19.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron	†10.00
Buffalo, steel	16.00-16.50
Chicago, iron	14.00-14.50
Chicago, rolled steel	14.50-15.00
Cincinnati, iron	14.00-14.50
Eastern Pa., iron	15.50
Eastern Pa., steel	17.00-17.50
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel	17.50-18.00
St. Louis, iron	12.00-12.50
St. Louis, steel	14.50-15.00

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†11.00
N. Eng. del. No. 2	12.00
N. Eng. del. textile	15.00-15.50
Buffalo, cupola	13.50-14.00
Buffalo, mach.	15.00-15.50
Chicago, agri. net	10.50-11.00
Chicago, auto	11.50-12.00
Chicago, railr'd net	10.50-11.00
Chicago, mach. net	11.50-12.00
Cincin., mach. cup.	10.50-11.00
Cleveland, mach.	17.00-17.50
Eastern Pa., cupola	15.50-16.00
E. Pa., mixed yard	13.50-14.00
Los Angeles	13.00-14.00
Pittsburgh cupola	15.50-16.00
San Francisco, del.	13.50-14.00
Seattle	8.00
St. Louis, No. 1	10.00-10.50
St. L., No. 1, mach.	12.00-12.50
Toronto, No. 1, mach., net	12.50

HEAVY CAST

Boston dist. break.	†9.00- 9.50
N. Eng., del.	11.50-12.00
Buffalo, break	11.00-11.50
Cleveland, break.	14.00-15.00
Detroit, break.	10.50-11.00
Detroit, auto net	12.50-13.00
Eastern Pa.	14.00-14.50
Los Angeles	13.00-14.00
New York, break.	†10.50-11.00
Pittsburgh	12.50-13.00

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	16.00
Buffalo	13.50-14.00
Chicago, R. R.	14.00-14.50
Cincin., agri. del.	10.00-10.50
Cleveland, rail	15.50-16.00
Detroit, auto	11.50-12.00
Eastern Pa., R. R.	15.50-16.00
Los Angeles	13.00-14.00
Pittsburgh, rail	14.25-14.75
St. Louis, R. R.	13.00-13.50

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Boston	†12.00
Chicago	15.00-15.50
Eastern Pa.	18.00-18.50
New York	†15.00-15.50
St. Louis	13.50-14.00

LOCOMOTIVE TIRES

Chicago (cut)	14.50-15.00
St. Louis, No. 1	13.75-14.25

LOW PHOS. PUNCHINGS

Buffalo	16.00-16.50
Chicago	14.00-14.50
Eastern Pa.	18.00-19.00
Pitts. (lt. & hvy.)	17.00-18.00
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ % Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00-13.00
No. Afr. low phos.	nominal
Swedish low phos.	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton. unit, duty paid nom.	24.50-25.50
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$25.50-26.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	non. 45.00
So. African, 50-52%	nom. 45.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 68

Pittsburgh — Miscellaneous sheet business continues to increase, although the brightest part of the market is in export business, which is active. Domestic orders are now widely diversified and sheet producers are somewhat cheered over the automotive situation, with the possibility that more releases may come on automotive sheets. Production has moved up somewhat and it is in the neighborhood of 30 per cent. Prices remain firm and no break is anticipated.

Cleveland — New business continues to fluctuate daily, but specifications this month have improved somewhat over February. Demand from stamping concerns and other partsmakers supplying the automotive trade is noticeably absent. Many still have excess stocks of finished parts and are in no hurry to rebuild steel inventory. Producers report operations are irregular, closely scheduled to incoming tonnage.

Chicago — Business is heavier in a number of directions. Automotive interests continue to restrict purchases, however, and demand elsewhere is insufficient to bolster shipments to any marked degree. Production is slightly heavier, but mills are able to offer deliveries of one to two weeks on hot-rolled sheets and two to three weeks on hot-rolled annealed, cold-rolled and galvanized material.

New York — A decidedly spotty situation prevails in sheets, with some sellers noting rather substantial percentage increase so far this month, while others report little change. Two leading interests report more business during the first half of the month than in all of February. High spots appear to be more active buying by refrigerator and air conditioning manufacturers and replacement buying by jobbers. However, volume continues well under normal. A sizable sheet tonnage is still pending for the 500 box cars to be built by the Magor Car Corp. at Passaic, N. J., for the Bangor & Aroostook.

Boston — With the carload rate from Pittsburgh advancing three cents per 100 pounds over the present schedule to 44 cents, delivered prices on sheets in this territory will average about 60 cents a ton higher under the new freight charges. Freight from Buffalo will be 37.5 cents. In spots there has been an upturn in sheet buying, a development based on actual needs rather than anticipatory covering.

Low quotations by jobbers on license tag stock, 1002 tons for three states, were exceptional, most mills quoting direct, holding to listed prices. On 750 tons, No. 23 gage, hot-rolled, pickled and annealed material for Massachusetts, Avery & Saul Co., South Boston, quoted 3.71c a pound, delivered, Charlestown prison (Boston) in 50-ton lots starting July 1 and continuing in equal shipments every 25 days until completed. This price is substantially under mill quotations for such material, including extras, pickling, etc., which figures approximately 4.2725c under the present freight or about 4.3025c under the proposed carrying charges which will be operative during the period of shipments. Twenty-two bidders quoted this inquiry, opening March 15.

L. E. Zurbach Steel Co., Cambridge, is low on 150 tons, 24 gage, 31½ x 90½, hot-rolled, pickled and annealed sheets, delivery at the prison, Thomaston, Me., quoting 3.80c, deliveries starting June 15. Eleven bids for this tonnage with 3.86c quoted by most mills direct. For New Hampshire, the same jobber quoted 3.75c on 102 tons, 23 gage, 31 x 70, hot-rolled pickled, annealed sheets, delivery, Concord,

Thomastrip
COLD ROLLED STRIP STEEL

ELECTRO ZINC COATED
ELECTRO COPPER COATED
ELECTRO NICKEL COATED
ELECTRO BRASS COATED
BRIGHT FINISH UNCOATED

THE WORLD
Is Our Showroom

You will find exhibited in every world market products made of Thomas Cold Rolled Strip. And, by these products The Thomas Steel Company enjoys an enviable reputation for unusual ability to match cold strip with the product and fabricating problems. Fewer operations, better products, faster production, and less waste are important advantages gained with specialized Thomas Cold Rolled Strip. In coils or cut lengths, it is precision-made to temper, gauge, width, in plain bright and special coated finishes as desired. An unusual service advantage is that executive, general sales, production, and engineering departments are ALL located at the mill in addition to district offices located in the principal markets. With these merits, it will pay you to check the application of Thomastrip to your particular product.

THE THOMAS STEEL CO. Warren, O.
Specialized Producers of Cold Rolled Strip Steel

N. H., most mills quoting 3.81c, shipments May 9.

Philadelphia — No further releases of sheets by the auto trade are reportted following several hundred tons of hot and cold-rolled grades ordered out the previous week. A few small orders from miscellaneous sources are sufficient to make March volume appear slightly better than February but the total is unsatisfactory.

Cincinnati — Domestic demand for sheets is showing consistency but a disappointing rate of improvement. Most recent mill bookings are between 35 and 40 per cent of capacity on broad needs, led by galvanized requirements. Chief restriction to volume is the retarded seasonal gains in automobile and household equipment manufacture.

St. Louis — Considerable spottiness obtains in demand for both cold and hot-rolled sheets, with miscellaneous requirements still predominating. Enameling stock shows more life, reflecting partly resumption of operations by the stove industry and fair takings by refrigerating and metal furniture manufacturers. Outlet through the farm implement industry, while measurably below the peak last year, is still fairly satisfactory.

Birmingham, Ala. — Manufacturers' sheets continue to lead the demand in that specification although there has been somewhat of a recession in the past two weeks. Business is still scattered and in comparatively small lots.

LEADERSHIP

FOR OVER FIFTY YEARS

● Ever since the world's first tri-motor electric crane was built in the P&H shops, more than 50 years ago, P&H has continued its leadership as America's largest builder of overhead handling equipment.

When you turn to this group of specialists, you avail yourself of the broadest possible experience in the handling of materials with electric traveling cranes. Offered in all capacities from 5 to 300 tons. Your inquiry will receive every consideration. The Harnischfeger Corporation, 4411 W. National Ave., Milwaukee, Wisconsin.

HARNISCHFEGER CORPORATION

HOISTS • WELDING ELECTRODES • MOTORS P&H EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

Strip

Strip Prices, Page 69

Pittsburgh — The production picture in both hot and cold strip remains unchanged, with lack of automobile business still a depressing factor. Operating rate still hovers around 20 per cent in both divisions.

Cleveland — Producers report operations continue uneven, closely balanced with incoming business. However, rollings have increased somewhat, reflecting a moderate improvement in total number of orders. Whether this is strictly seasonal or a forerunner of increasing volume of business is uncertain. The fact that inventories are substantially lower than four to six weeks ago is an important factor. However, buying continues on a hand to mouth basis.

Chicago — Strip demand shows moderate gains compared with a month ago despite the slowness with which automotive requirements appear. Orders reflect the low level of users' stocks, but most purchases are small.

Boston — On cold strip based at Worcester, Mass., car lot advances in delivered prices to New England consuming points will be insignificant under the proposed freight schedules, less than 2 cents per 100 pounds for the longer hauls above the present rates. Low operations by manufacturing consumers continue to be reflected in demand for narrow cold strip, which is slack and unchanged. Users are buying only what is needed for prompt shipment and have been working off inventories slower than expected. The advance on hot strip under the new freights in car lots will be greater as compared with cold stock, the Pittsburgh rate advancing three cents to 44 cents per 100 pounds. Prices are steady and not subject to pressure.

New York—Demand for cold strip has not changed materially, incoming orders being for small lots for prompt shipment with an occasional car lot. For some goods consumers are still working on inventories, which are lower, although stocks of finished products and parts are

rather large in some instances. Buyers appear determined to move such goods before covering beyond immediate needs. Specifications are well spread. Operations in few instances are better than 30 per cent. Hot-rolled buying is sluggish, rerolling operations being curtailed and stocks, based on current activity, are ample in many shops. Prices are steady.

Philadelphia — Strip demand is quiet. While some stampers are figuring more work it is slow to reach the active state. Little deviation is seen in prices.

Birmingham, Ala. — Strip is at the lowest level of several months with little improvement likely until the next cotton tie season.

Plates

Plate Prices, Page 68

Pittsburgh — Little change has been noted in the plate market, although some construction is now being released and there is fair activity in barge construction. Tonnages for the first half of March will probably be slightly improved over the same period in February.

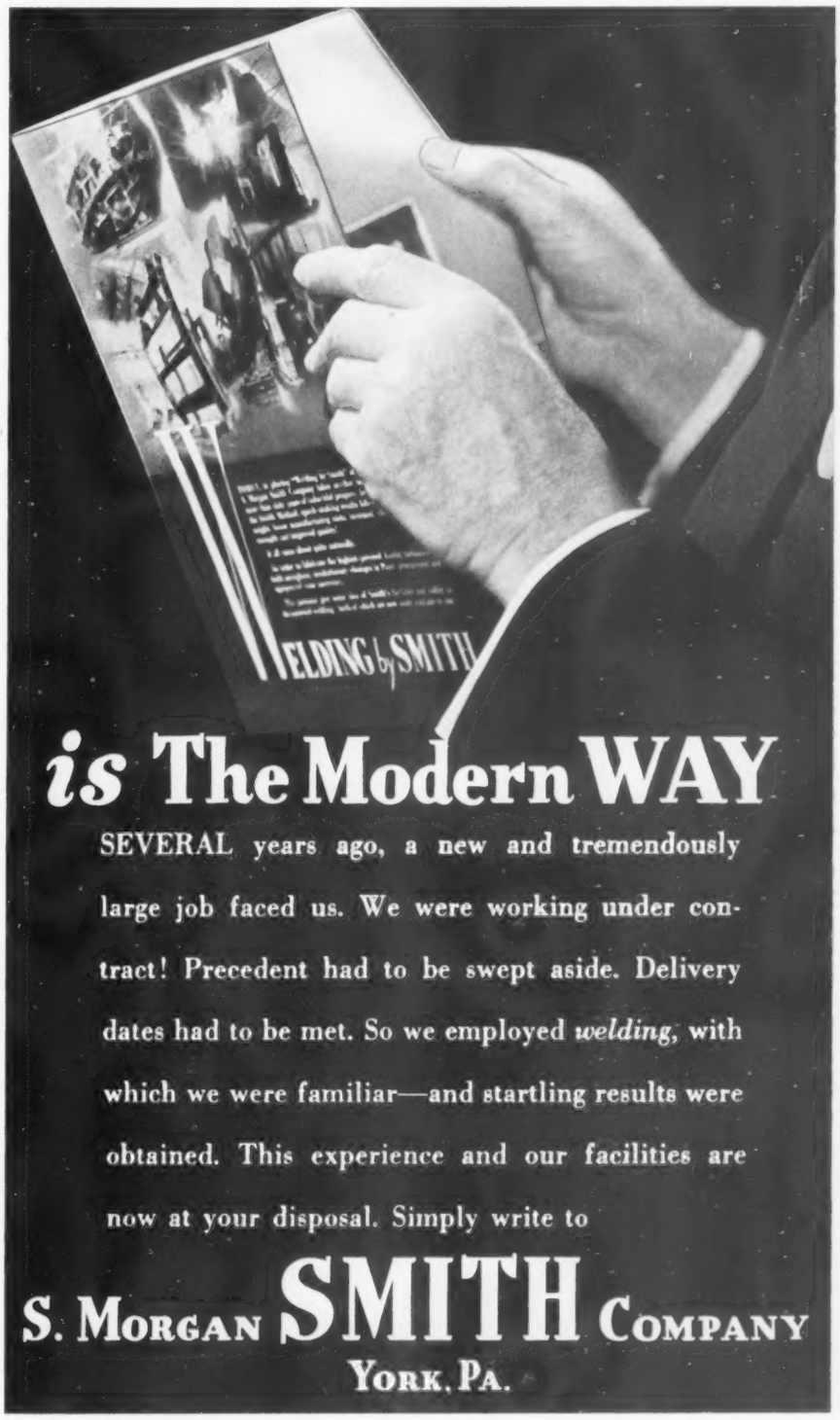
Cleveland — Demand for wide and narrow plates is substantially unchanged although a moderate improvement is noted in some instances. Specifications from railroads has yet to show improvement. Miscellaneous requirements are fair with a slight improvement noted from a number of sources. Prices remain firm.

Chicago — Scattered improvement in plate demand is coming principally from structural fabricators and miscellaneous consumers. Railroad requirements continue light, and there is little hope of any marked upturn in plate consumption for railroad equipment building in the near future. Freight car repair work involves only moderate lots.

Boston — Miscellaneous buying in small lots accounts for most plate volume being placed, fabricators with few exceptions consuming less than seasonal tonnage. The car-building plant at Worcester, Mass., has booked additional orders. Demand for oil refinery work is also slightly improved. Shipyard outlook continues promising. Structural demand is light, but some tonnage is required for tainter gates and equipment for a Vermont dam.

New York — Approximately 4000 tons of plates, it is conservatively estimated, will be required for 30 arc welded steel scows to be inquired for shortly by the municipal department of purchases for the sanitary department. The scows will be 150 feet long with a 37-foot beam. Plans are now available and a date for bids is expected to be fixed soon. Close to 1000 tons of plates have been placed recently by Alco Products Inc., this city, for refinery work for the Cities Service Co. in Philadelphia, East Braintree, Mass., and East Chicago, Ind. Action is expected this week in placing steel for the 500 steel sheathed box cars to be built in this district for the Bangor & Aroostook. A modest tonnage of plates will also be required for the 50 subway cars for the Interboro Rapid Transit Co. on which bids go in March 22. Plate business in general, however, shows little improvement.

Philadelphia — Platemakers are depending principally on shipbuilders to bolster backlogs but this tonnage is slow to come out. Actual placing of steel for Standard Oil tankers by four yards is delayed by lack of decision at Washington on proper design. Considerable government tonnage for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dredges and tenders is still pending, and long overdue. Some miscellaneous tank work is appearing but total tonnage is not important. Railroads are still out of the market even for routine requirements and are not expected to take action for a month or so after the advanced rates take effect.

Birmingham, Ala. — While output of plates is comparatively quiet, mills report some business available from miscellaneous sources. Expectations are that the district will receive most of approximately 6000 tons to be placed by a local fabricator for barges for the Inland Waterway Corp.

San Francisco — Demand for plates continues irregular with little tonnage in sight. The largest letting went to Steel Tank & Pipe Co. and called for 200 tons for a 26-inch welded steel pipe line for the treasury department, San Francisco. Bids have just been taken on 150 tons in addition to 75 tons for shapes for two welded steel barges for the United States engineer, San Francisco. So far this year 13,501 tons have been placed, compared with 20,737 tons for the corresponding period in 1937.

Seattle — Shops report a fair volume of work in small lots, but large projects are lacking. Several steel storage tanks are included in water system plans by various Washington and Oregon cities. Seattle has rejected bids for the city light department proposed bypass, 72-inch welded pipe, for the Ruby dam project, new bids to be called several months hence. Puget Sound Machinery Depot, Seattle, was low at $14,414, the project involving 100 tons of plates and 25 tons of shapes for trashracks. Service Electric Welding Co. has the contract for welding 10,000 feet of 30 to 48 inch steel water pipe for Tacoma.

Plate Contracts Placed

1925 tons, six tanks, Pan-American Petroleum & Transport Co., Texas City, Tex., to Chicago Bridge & Iron Co., Chicago; reported last week as going to an unstated fabricator.

1000 tons, approximately, refinery expansion work for Cities Service Co., New York, awarded through Alco Products Inc., that city.

200 tons, 36-inch welded steel pipe, treasury department, invit. 5085, San Francisco, to Steel Tank & Pipe Co., Berkeley, Calif.

Unstated tonnage, 75,000-gallon elevated steel water tank, town of Greenfield, Milwaukee county, Wis., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Unstated tonnage, elevated tank, torpedo station, Newport, R. I., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Plate Contracts Pending

4000 tons, 30 scows, New York City, department of purchases, bids to be asked soon.

150 tons in addition to 75 tons of shapes, two welded steel barges for United States engineer office, San Francisco, invit. 863-38-107; bids opened.

Unstated tonnage, one to three lighthouse tenders, department of commerce, bureau of lighthouses, Washington: Marine Iron & Shipbuilding Co., Duluth, low on one vessel, $190,000; Philadelphia Shipbuilding Co., Philadelphia, low on two vessels, $430,365; John H. Mathis Co., Camden, N. J. low on three, $631,422; prices are exclusive of delivery charges to Buffalo, Key West, Fla., and Philadelphia; bids March 15.

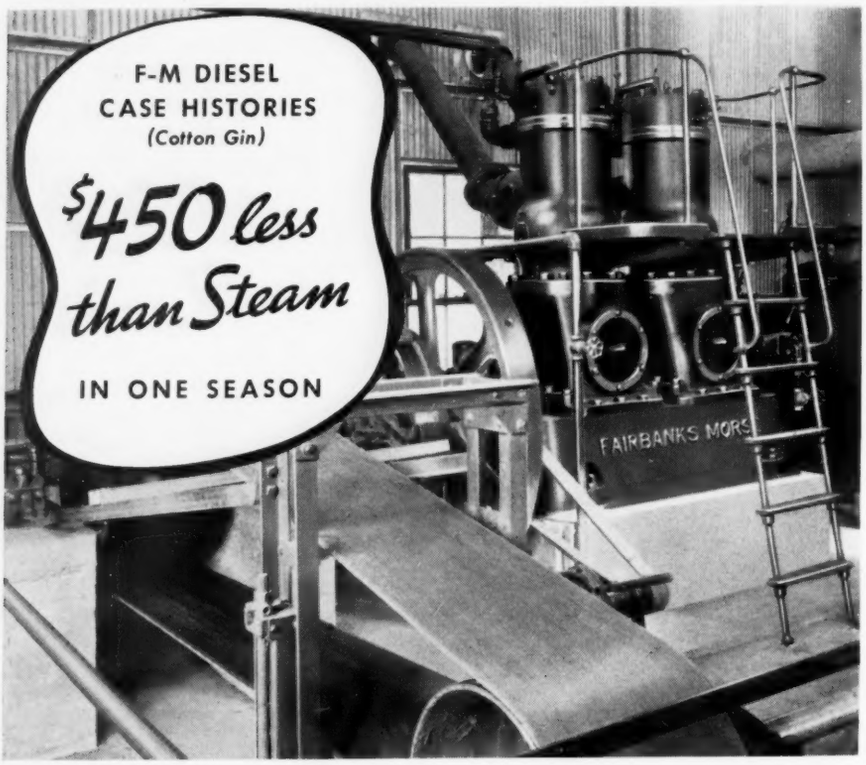
Unstated tonnage, two diesel dredge tenders, U. S. engineer, Memphis, Tenn.; bids April 5, cir. 221F.

Unstated, pipe fittings, etc., for Coulee dam, Spec. 1047-D; bids at Denver, March 28; bureau of reclamation.

Tin Plate

Tin Plate Prices, Page 64

Pittsburgh — Production is still fairly active, with the rate around 60 per cent. Seasonal demand is good on packers' cans, with some commodities expected to require larger tonnages than last year. General line business is slightly better and the possibility of fair tonnages in this division is seen.



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Bars

Bar Prices, Page 68

Pittsburgh — Greater diversification and some slight increases in orders for steel bars have been noted. Absence of automobile buying has restricted the tonnage and it does not appear at present that any great activity can be expected. However, orders from a wide front are a little more frequent and are building up production rates slowly.

Cleveland — Specifications for carbon and alloy steel bars are irregular. An encouraging note is that a number of companies have been forced to re-enter the market after an absence of some months. While this new business is limited to actual requirements any increase in operations by these consumers will immediately be reflected in renewed demands for raw steel.

Chicago—Bar sales show further improvement, gains resulting principally from more diversified demand from miscellaneous consumers. Farm equipment manufacturers continue the leading support to bar business, with automotive buying showing no appreciable gains. Prompt shipment requested on most orders, and the appearance of some buyers in the market for the first time in many weeks attest to the low level of consumers' stocks.

Boston — Stocks of alloy bars are getting low on some sizes and specifications, which has resulted in some buying, notably by warehouses, although orders are small and for prompt shipment. While railroad demand is slack, car-building needs are slightly heavier. Cold-finished bars move slowly to machinery builders. Forging material demand is steady with consumers releasing limited lots for early delivery.

New York—Despite lack of railroad buying, bar tonnage is expanding. Machine tool builders and manufacturers of special equipment over the past fortnight have specified more freely and there is increasing buying of special steels by the government for manufacture of airplanes and other munitions. In the near future, when the new freight rates become effective, the New York delivered price on commercial bars will be 2.815c, compared with 2.79c at present.

Philadelphia — Commercial steel bar specifications show slight improvement but early deliveries are difficult, due to light mill order backlogs for individual sizes and analyses. Warehouses are probably the most active buyers, despite fairly heavy stocks.

Birmingham, Ala. — Some slight improvement in bars is evident, with indications of considerable business forthcoming from farm equipment manufacturers, although there has been no definite buying as yet.

Pipe

Pipe Prices, Page 69

Pittsburgh — Pipe markets remain inactive, with the only movement occurring in oil country goods. First half of March probably will show a slightly increased tonnage over the first half of February, although not up to normal seasonal increase.

Cleveland — Specifications for standard steel pipe out of jobbers' stock has improved slightly over the comparable period during February. Most distributors are still carrying substantial inventories on a number of sizes. Considerable work should develop in a number of small municipalities with the approaching favorable weather and

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Behind the Scenes with STEEL

Scrap Low in Pitt

■ Down in Pittsburgh where the scrap trade has died a horrible death of late there is still the funny side to be seen. Our Pittsburgh operative gumshoed his way into one scrap dealer's office to find the estimable gentleman fiddling around with a candid camera, trying to get a picture of the bottom side of his office table. In another office, a dealer was complaining bitterly about the bad weather because he wanted to go out and play golf while waiting for business to appear. In a third the boys were playing a fine game of three-handed rummy with the stenographer while a radio beat out jazz.

Strip Tease

■ Republic's new 98-inch strip mill has gone into what the local newspapers term "formal operation" and, although no white ties or tails were in evidence at the official debut, technical editors from wide and far swarmed into the Flats of the Kinky Cuyahoga to witness this latest marvel of industry. Of course, STEEL's editors had little more to do than jump out their windows and roll down the hill in order to be right on the scene, but they've come back with a big two-part story. The first installment starts on page 36 of this issue, and the second episode will be shown by this theater at the same time next week.

Negative Appeal

■ The Readers Service Department is frequently called upon to fulfill some weird requests, but this week the Circulation Department was faced with a real stumper. Ingalls Iron Works out in Frisco just renewed its subscription and, as sort of a postscript, adds: "Send us any issues that you may not have". Since there are no issues of STEEL that we don't have, it would seem that the Californians can look forward to not receiving them. Worse yet, if there were any issues we didn't have, and we went ahead and got them, then they wouldn't be issues that we didn't have and Ingalls probably wouldn't want them.

Also Harmon

■ A punster within our ranks is laughing up his sleeve at our interest in what he described to us as the astounding enterprise of the Izing Brothers, whose shops and plants, he pointed out, are seen everywhere these days. This column, he suggested, should make editorial mention of the Izing Brothers' far-flung interests. But by the time our interest was at its height, he paused to mention the brothers' names are Galvan and Vulcan. Relatives, we presume, of Spheroid, Magnet, Normal, Chapman, and of course those bouncing baby twins, Carbur and Decarbur.

Monetary Matter

■ The Swiss, inventors of ventilated cheese, have again come through, this time with a process for spraying metal on paper money. Of course, it's a great thing and all that, but we're withholding comment until someone invents a process for spraying paper on metal money.

Back to the Farm

■ Readers attending the recent agricultural equipment show at Wichita, Kans. were impressed with the optimism evinced there. (The readers were optimistic —none of our editors were there). Anyway STEEL detailed Chicago Editor Bill Gude to investigate the reasons for so much good feeling, and the result is the informative article found on page 17 of this issue.

—SHRDLU

the recent tendency of WPA to expand its activities. Prices are firm.

Chicago — Cast pipe inquiries are slightly more numerous, and while business is slow to improve the tendency is upward. Further moderate gains are anticipated with the approach of spring. Chicago is in the market for 203 tons of fittings and 125 tons of offset bends.

Boston — Cast pipe buying is seasonally active, although somewhat slower than during the last two weeks. Close to 1000 tons will be placed by two cities this week and about an equal tonnage is up for bids. On 10,000 feet, 1½-inch galvanized wrought iron pipe, Camp Devens, Mass., four bidders quoted 23.72c, delivered.

New York — Led by 1600 tons for New York city yards stocks, closing March 25 with the department of purchase, cast pipe inquiry is heavier. This inquiry also includes 185 tons of special castings. Several hundred tons are out for Bayonne, N. J., Crotona Park, N. Y., and Yorktown, N. Y., while a contractor's letting at Washington, closing March 22, takes 1685 tons, 30-inch. For most New York city departments, bids close March 24 on second quarter needs of small-diameter steel and wrought iron pipe with the department of purchase.

Birmingham, Ala. — Pipe plants remain generally on a three day basis with expectations of some additional business before the end of first quarter. Some improvement is reported in miscellaneous inquiries.

San Francisco — Awards of cast iron pipe were limited to lots of less than 100 tons. No award has yet been made on 376 tons for Lowell, Wash., nor on 250 tons of 4 and 16-inch pipe for Los Angeles. So far this year 6463 tons have been placed, compared with 5728 tons for the same period a year ago.

Seattle — Several large tonnages are pending, with bids opened or coming up for figures. New bids may be called on the 1200 tons cast iron pipe for Seattle's cross-town improvement. Proposed Queen Anne extension is not yet out for figures.

Cast Pipe Placed

1200 tons, various sizes, Colorado Springs, Colo., to American Cast Iron Pipe Co., Birmingham, Ala.

880 tons, 8 and 20-inch, including 80.5 tons special castings, Washington, to Florence Pipe Foundry & Machine Co., Florence, N. J., $43,851; bids March 7.

125 tons, various sizes and fittings, water main, Avenue P, Brooklyn, to United States Pipe & Foundry Co., Burlington, N. J.; A. W. Banko, Inc., Hastings, N. Y., general contractor.

115 tons, sewage disposal plant, Circleville, O., to J. B. Clow & Sons Co., Cleveland.

100 tons, centrifugal cast pipe, 270 feet of 8-inch, 965 tons of 6-inch and 1650 feet of 4-inch, Bethesda, O., to J. B. Clow & Sons Co., Cleveland.

Cast Pipe Pending

1600 tons, 8 to 20-inch, department of purchase, New York city, bids March 25, delivery to five borough yards; inquiry also includes 185 tons of special castings; 732 valves, 6 to 20-inch; 75 hydrants and wrought iron or steel rodding bands with necessary main bolts, small bolts, spreaders and washers.

420 tons, 12-inch, with fittings, water main, dock terminal, Bayonne, N. J.; bids March 23.

320 tons, mostly 6-inch, water line and filtration plant, Thiels, N. Y., contractors' letting, bids March 30.

203 tons, fittings for 3 to 24-inch pipe, and 125 tons, 6, 8 and 12-inch offset bends, Chicago; bids March 23.

175 tons, 2 to 8-inch, new water distribution system, Dillonvale, O.; bids March 28.

153 tons, 6-inch, Class 150, Whittier, Calif.; bids opened.

100 tons, 6 and 8-inch, Aberdeen, Wash.

Unstated tonnage, extension of water system, Lorain, O.; cost $45,000.

Unstated tonnage, water main, Canton, O., involving 1650 feet of 12-inch, 2750 feet of 8-inch and 2850 feet of 6-inch; cost $63,000.

Wire

Wire Prices, Page 69

Pittsburgh—Merchant wire is still in better demand than manufacturers' wire. Farm demand has come later than usual this year and fairly strong. This factor will probably mean second-quarter production will be substantially better than the first. A little greater activity in manufacturers' wire is anticipated. The price is becoming firmer.

Cleveland — Sellers of manufacturing wire and merchant wire products note a decided improvement in aggregate tonnage this month. This improvement has for the most part originated from rural districts reflecting increased seasonal activities. Demand for manufacturing wire from bolt and nut concerns and auto partsmakers has failed to show the expected improvement. Some sellers estimated shipments during March will exceed February by as much as 20 per cent.

Chicago—Activity in both manufacturers' wire and wire products is improved, and March sales are expected to be the best of this quarter. Orders for manufacturers' wire are well diversified, with the automotive industry showing less than average betterment in its purchases. Shipments of merchant wire products to farm districts are expanding, and fairly active sales are expected this spring in view of sustained farm income.

Boston — Slight improvement registered in wire buying has been irregular and confined to a few products, demand for wire rope railing, merchant goods and electrical cable being mildly improved. Portsmouth, N. H., navy yard, through Washington, has estimates on insulated electric cable approximating $95,000, all bids being identical. Mills producing material for the automotive industry or those whose output ultimately finds an outlet through that channel, especially are slowed down by lack of buying. Textile equipment requirements are also off and recovery in manufacturers' wire and rods is slow. Carload shipments to New England consuming points, based on Worcester, Mass., will be only slightly changed as to delivered prices under the new freight rates, nearly the full 10 per cent being applied under the emergency advance last November, including Framingham, Hopedale and Whitins, Mass. In the three northern states, notably Maine, the advance

will be the most, but in few instances as much as 2 cents per 100 pounds over current schedules.

New York—Except for the automotive industry, there has been slight improvement in wire buying, mostly by miscellaneous consumers, with improvement more evident in merchant products than for manufacturers' wire. Demand for the later is still spotty with users buying small lots for prompt delivery.

Birmingham, Ala.—Wire remains one of the steadiest classifications. Mills report the demand in somewhat less volume than anticipated but generally satisfactory.

Rails, Cars

Track Material Prices, Page 69

Placing of 30,000 tons of rails by the Chicago, Burlington & Quincy and 10,930 by the Western Pacific, the latter to the Colorado mill, make the high spots of the week in the railroad market.

Bids will be opened March 22 for 50 subway cars in New York. It is hoped Western Maryland, Delaware, Lackawanna & Western and Lehigh & New England, each of which withdrew car inquiries within the past few months, may decide to reinstate them.

Car Orders Placed

Navy, Five 50-tons flat cars, to American Car & Foundry Co., New York, and one 70-ton flat car to Haffner Thrall Car. Co.

Rail Orders Placed

Chicago, Burlington & Quincy, 30,000 tons divided among various producers; also 10,000 tons of fastenings.

Car Orders Pending

Navy, five freight cars for White Plains, bids April 5; specifications call for three 50-ton steel underframe flat cars, one 8000-gallon tank car and one 50-ton steel sheathed box car.

Buses Booked

Twin Coach Co., Kent, O.: Twenty 23-passenger and seven 31-passenger for Tacoma Railway & Power Co., Tacoma, Wash.; ten 31-passenger for Motor Transit Co., Jacksonville, Fla.; four 27-passenger for Mill Power Supply Co., Charlotte, N. C.; two 31-passenger for American Factors Inc., New York; two 23-passenger for Market Street Railway Co., San Francisco.

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Shapes

Structural Shape Prices, Page 68

New York — Award of 2685 tons for world's fair buildings with an increase in estimates for this project features an otherwise slow structural steel market, although small-lot inquiries are slightly heavier. Contracts are expected this week on several thousand tons for a Washington art museum building to be placed by a New York contractor, Marc Eidlitz & Son, a firm which will also purchase close to 1000 tons for another world's fair building.

Pittsburgh — Awards show a slight increase, with a number of new projects entering the market. There are still quite a few contemplated projects which are being held up, but will eventually enter the market and may provide a fair tonnage in the late spring.

Cleveland — Structural steel requirements have failed to improve materially, although an increasing number of inquiries involving small tonnages are appearing from private sources. The labor question in connection with the Main street bridge project, Cleveland, involving some 9000 tons, has been settled and county commissioners will advertise for the reinforcing and structural steel soon. Fabricated prices continue weak but mill prices are firm.

Chicago—Structural inquiries are lighter, new projects totaling less than 5000 tons. The bulk of this business is made up of individual lots of less than 100 tons. Awards are few, the largest being 3000 tons for the Clarksville, Mo. dam, in addition to 1500 tons of piling for the same project.

Boston—Low on structural steel in place for the Ashland-Bridgewater, N. H., bridge was 6.10c, about 800 tons being involved. This was submitted by the second low bidder. The award of two small bridge contracts for Vermont bridges, about 200 tons, to a New Castle, Ind., fabricator has at-

Shape Awards Compared

	Tons
Week ended March 19	20,632
Week ended March 12	20,949
Week ended March 5	9,403
This week, 1937	33,013
Weekly average, year, 1937	16,060
Weekly average, 1938	14,331
Weekly average, February	10,059
Total to date, 1937	333,283
Total to date, 1938	171,967

Includes awards of 100 tons or more.

tracted unusual attention. Plain material to Boston district shops under the new freight schedules, now being compiled, will probably be 2.66½c against 2.64½c now prevailing.

Philadelphia — Bonds totaling $30,000,000 have been sold as part financing plan of a 161-mile Harrisburg-Pittsburgh all weather highway, and $30,000,000 WPA grant is expected shortly. This project is expected to require approximately 50,000 tons of steel, involving shapes and bars. Bids on final job, $65,000,000 institutional program, involving expenditure of $2,142,062 for boys' industrial school, White Hill, Cumberland county, Pennsylvania, are due next month.

Buffalo — Although few large structural projects are pending, an assortment of private and public jobs, calling for moderate tonnage, is creating a fairly good tone in the shape market. Up for bids this week are 500 tons for Neisner Brothers store, Buffalo.

San Francisco — Bids open March 31 for a crossing over the Southern Pacific Co. tracks near Hewitt, Los Angeles county, California, calling for 215 tons. Bids have been taken on 245 tons for a steel warehouse at the Shasta dam, Calif. Awards totaled 574 tons bringing the aggregate for the year to 18,262 tons, compared with 58,390 tons a year ago.

Shape Contracts Placed

4592 tons, Mississippi river dam, Clarksville, Mo., to R. C. Mahon Co., Detroit; includes 1500 tons of piling reported to Inland Steel Co., Chicago.

1750 tons, transportation building, world's fair, New York, to Post & McCord, New York; George A. Fuller Co., New York, general contractor.

1400 tons, Magnin store building, Los Angeles, Calif., to American Bridge Co., Pittsburgh.

1050 tons, piling and accessories, Miami beach shore development Co., Miami, Fla., to Bethlehem Steel Co., Bethlehem, Pa.

1030 tons, addition and alterations, Burdine store building, Miami, Fla., to Virginia Bridge Co., Birmingham.

935 tons, building, Ford Motor Co., world's fair, New York, to Harris Structural Steel Co., New York.

800 tons, hangar Bolling field, Washington, to Lehigh Structural Steel Co., Allentown, Pa.; Virginia Engineering Co., Newport News Va., general contractor.

797 tons, approaches, bridge, St. Lucie river, Florida East Coast railroad, Stuart, Fla.; 508 tons piling, to Carnegie-Illinois Steel Corp., Pittsburgh; 289 tons, shapes, to Bethlehem Steel Co., Bethlehem, Pa.; Cleary Construction Co., West Palm Beach, Fla., general contractor.

750 tons, hospital, Danville, Pa., to Fort Pitt Bridge Works, Pittsburgh.

615 tons, buildings No. 80 and 81, Aluminum Co. of America, Mobile, Ala., to Ingalls Iron Works, Birmingham, Ala.

600 tons, piling and shapes, approaches and piers, Meeker avenue bridge, Brooklyn, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; through Charles R. Vachris Inc., Brooklyn, N. Y., general contractor.

500 tons, school, Jeffersonville, N. Y., to Belmont Iron Works, Eddystone, Pa.; J. Bisceglia & Son, Inc., Harrison, N. Y., general contractor.

450 tons, building, Oklahoma A. and M. college, Stillwater, Okla., to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla., C. M. Dunning Co., Oklahoma, general contractor.

400 tons, H-piling, Washington state Puget Island bridge, to Bethlehem Steel Co., Seattle.

365 tons, high school, Ames, Ia., to Pittsburgh-Des Moines Steel Co., Des Moines, Ia.

340 tons, Littauer public administration school building, Harvard university, Cambridge, Mass., to New England Structural Co., Everett, Mass.; The Aberthak Co., Boston, general contractor.

260 tons, Bala-Cynwyd, Pa., to Roy A. Robinson, Philadelphia; through Barclay White & Co., Philadelphia.

250 tons, building, Washington National Insurance Co., Evanston, Ill., to Wendnagel & Co., Chicago.

245 tons, shopping center, Silver Spring, Md., to Barber & Ross Co., Inc., Washington.

235 tons, powerhouse, Bellevue hospital, New York, to Jones & Laughlin Steel Service Corp., Long Island City, N. Y.

205 tons, bridge 326-418-419, Portage county, Wisconsin, to Wausau Iron Works, Wausau, Wis.

200 tons, flat piling, Washington state Puget Island bridge, to Columbia Steel Co., Portland.

200 tons, bridge, Public Power & Irrigation district, Nebraska, to St. Joseph Structural Steel Co., St. Joseph, Mo.

190 tons, section 10H-F, Mt. Pulaski, Logan county, Illinois, to Missouri Bridge & Iron Co., St. Louis.

185 tons, bridge 378, Clark county, Wisconsin, to Fort Pitt Bridge Works, Pittsburgh.

185 tons, addition, state hospital, Wernersville, Pa., to Fort Pitt Bridge Works, Pittsburgh.

180 tons, memorial auditorium, Burlington, Ia., to Fort Pitt Bridge Works, Pittsburgh; Peter Kiewit Sons Co., Omaha, Nebr., general contractor.

180 tons, religious school, Rodef Shalom congregation, Pittsburgh, to Reliance Steel Products Co., Pittsburgh.

165 tons, building, Conlon Baking Co., Charleston, W. Va., to Ingalls Iron Works, Birmingham.

160 tons, bridge, Jefferson county, Iowa, to Clinton Bridge Works, Clinton, Ia.; Jensen Construction Co., Kimballtown, Ia., general contractor. Pittsburgh-Des Moines Steel Co., Des Moines, awarded 32 tons, reinforcing bars.

150 tons, truss span, spec. 1020-D, Fresno, Mont., to Joseph T. Ryerson & Son, Inc., Chicago.

150 tons, plant buildings, Washington Brick Corp., Laurel, Md., to Dietrich Bros. Inc., Baltimore.

150 tons, theatre and store building, F. Kogod & M. Burka, Washington, to Dietrich Bros. Inc., Baltimore.

135 tons, conveyor bridges, Aluminum Co. of America, Mobile, Ala., to Southern Steel Co., Birmingham, Ala.

126 tons, sheet piling, bureau of reclam-

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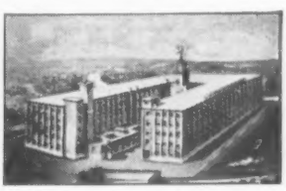

ation, invitation 24,608-A-1, Blaisdell, Ariz., to Carnegie-Illinois Steel Corp., Chicago.

125 tons, junior high school, Galveston, Tex., to Mosher Steel Co., Houston, Tex.

125 tons, building, Marist fathers, Framingham, Mass., to Eastern Bridge & Structural Co., Worcester, Mass.; I. P. Rocheford, Framingham, general contractor.

120 tons, Medio building, Albany, N. Y., to Utica Structural Steel Co., Utica, N. Y.; William J. Murray Co., Albany, general contractor.

120 tons, bridge No. 422, Waupaca county, Wisconsin, to Midland Structural Steel Co., Cicero, Ill.

117 tons, highway overpass, Walensburg, Colo., to Des Moines Steel Co., Des Moines, Iowa.

100 tons, bulkhead gates, Coulee power plant, to Mississippi Valley Structural Steel Co., St. Louis.

Unstated tonnage, riding hall, Fort Hoyle, Md., to Bristol Steel & Iron Works, Inc., Bristol Va., bids on steel direct, Pro. 418-42, quartermaster, March 10.

Unstated tonnage, transmission towers, transformers supports, Boulder switchyard, bureau of reclamation, Denver, to Mississippi Valley Structural Steel Co., Cicero, Ill., $6715, spec. 1041-D; bids March 1. Following inquiries temporarily withdrawn; Spec. 1042-D, rim towers, due March 2; spec. 1043-D, transmission towers, March 3; spec. 1046-D, transmission towers, March 11.

Shape Contracts Pending

3655 tons, ten buildings, Penn state college, State College, Pa.; bids March 29.

1800 tons, Lenox vocational school, Washington; bids April 15.

1140 tons, superstructure Washington state Puget Island bridge; bids at Olympia April 12.

1050 tons, apartment, Glenwood Gardens Inc., Yonkers, N. Y.

1050 tons, remodeling, postoffice, Grand Central annex, New York; Millimet Construction Co., Union City, N. J., contractor; bids March 8 at $1,849,000.

925 tons, building, world's fair, American Telephone & Telegraph Co., New York.

725 tons, bridge, Savannah river, McCormack, S. C., Nashville Bridge Co., Nashville, Tenn., low.

600 tons, plant extension, Pure Oil Co., Smith Bluff, Tex.

560 tons Washington state Hylebos bridge; bids at Olympia, April 12.

500 tons, building, Neisner Bros., Inc., Buffalo; bids March 25.

500 tons, shapes and bars, building No. 53, veterans' hospital, Lyons, N. J.; C. H. Johannsen & Co., Cliffside Park, N. J.; arch 8, awarded at $401,400.

450 tons, shapes and bars, building and utilities, veterans' hospital, Roanoke, Va.; A. Farnell Blair, Lake Charles, La., general contractor; bids March 1, awarded at $494,733.

450 tons, addition, public school 139; bids postponed to March 22, steel direct, fabricating and erecting, board of education, New York.

450 tons, shapes and bars, post office, Kalamazoo, Mich.; bids April 21.

327 tons, highway bridge, Pauls Valley, Okla.

300 tons, warehouse, Procter & Gamble, Baltimore; bids in.

275 tons, grade separation, Missoula, Mont.

260 tons, dormitory, Tarrytown, N. Y., bids in.

250 tons, world's fair railroad station, New York; bids in, board of transportation, New York.

245 tons, bridge superstructures, Compton Creek, Los Angeles county drainage area, bids March 25, U. S. engineer, Los Angeles, schedule 367.

245 tons, steel warehouse, Shasta dam, Calif.; bids opened.

225 tons, bridges, Atlantic and Union counties, New Jersey, taking bids.

225 tons, bridge repairs, Pennsylvania state highway commission; bids March 25.

215 tons, under-crossing, Southern Pacific tracks near Hewitt, Los Angeles county, California; bids March 31.

200 tons, garage, Sinclair Oil Co., Cherryvale, Kans.

200 tons, building, H. J. Heinz Co., Salem, N. J.; Austin Co., Cleveland, general contractor.

160 tons, state highway bridge, Ely, Nev.

150 tons, building, Northwestern Yeast Co., Chicago.

150 tons, research laboratory, Socony-Vacuum Oil Co., Paulsboro, N. J.

140 tons, shapes, plates and bars, second quarter requirements, New York city departments; bids March 22, department of purchase.

130 tons, two I-beam bridges, Armstrong and Clarion counties, Pennsylvania; bids to state highway department, Harrisburg, Pa., March 25.

125 tons, bridge, Scajaquada creek, Buffalo; bids March 24.

125 tons, building, Kansas City Packing Co., New York.

112 tons, road work, Somers Point, N. J., New Jersey highway commission; bids March 28.

110 tons, shapes and reinforcing, west approach, Connecticut river bridge, Middletown, Conn.; Arute Bros., Inc., New Britain, Conn., contractor, $59,711.07, bids March 7.

109 tons, shapes and bars, repairs, Shetucket river, Norwich-Sprague, Conn.; Medbury & Trowbridge, Putnam, Conn., general contractor, $26,099.70, bids March 7.

Unstated, I-beam span, Tillamook county, Oregon; bids at Portland March 24.

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Reinforcing

Reinforcing Bar Prices, Page 69

New York — Reinforcing steel buying is slightly heavier, contractors beginning to close on part of the tonnage held by price differences which will be slightly higher to distributors under the new freight rates. Recent efforts by sellers to stabilize the price structure have been more successful than previously. Increase in mesh requirements is outstanding in New York state. In addition to bar needs, the Lincoln tunnel approach contract, MHT-72, closing March 29, takes 29,500 linear feet of reinforcing trusses.

Pittsburgh — Shipments of reinforcing bars are somewhat better as a result of more frequent releases on previous orders with the approach of more open weather. This condition will probably result in an increase in orders through the

month exceeding that of February.

Cleveland — Inquiries and awards continue at the low levels of the past few weeks. With the exception of the Main street bridge, Cleveland, involving considerable tonnage, new projects are limited to tonnages well under 100 tons. No real test has been offered on prices recently, but fabricated prices remain weak on the small tonnage moving.

Chicago—Reinforcing bar inquiries continue to increase gradually, and while new work is made up principally of small lots, the amount of pending business is larger. Formal closing on 560 tons for the Clarksville, Mo., dam is in early prospect, while 300 tons has been placed for extensions to Soldier Field stadium, Chicago.

Boston — Part of the 1000 tons required for bridges and highways, about half for Connecticut, has been placed which coupled with an increase in small-lot buying, has stimulated activity considerably. Quotations on much of this tonnage frequently averaged 4.00c a pound in place while one leading estimate for mat reinforcement brought out a low of 23.00c a square yard. New billet bars, straight lengths, delivered, Boston, will advance to 2.87½c a pound under the new freight rate.

Philadelphia — Several fair-sized jobs are reported placed with district fabricators, including 1400 tons for Lit Brothers department store warehouse, Philadelphia, and like amount for Mont Alto sanitarium Several small jobs have also reached the active stage, especially ly in connection with the state institutional program. Prices are somewhat steadier.

Reinforcing Steel Awards

1400 tons, Sanitarium, Mont Alto, Pa., to Sweet's Steel Co., Williamsport, Pa.

1400 tons, warehouse, Lit Brothers department store, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

1136 tons, bureau of reclamation, invitation 24,605-A, Blaisdell, Ariz., to Southern States Steel Corp., Dallas, Tex.

925 tons, main approach, roadway and ramps, Bergenline and Pleasant avenues, Union City, N. J., Lincoln tunnel project contract MHT-71, to Joseph T. Ryerson & Sons Co., Chicago; through George M. Brewster & Son Inc., Bogota, N. J.

440 tons, immigration, customs building and plaza, Port Huron, Mich., divided as follows: 400 tons to Taylor & Gaskin Inc., Detroit, and 40 tons to Truscon Steel Co., Youngstown.

370 tons, bridge, 140th street and Grand Concourse, New York, to Fireproof Products Co., New York; Garafano Construction Co., Mt. Vernon, N. Y., general contractor; noted last week as going to unstated fabricator.

322 tons, bureau of reclamation, invitation 46,537-A and A46,546-A, Rutledge, Texas, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

300 tons, foundations, extensions to Soldier Field stadium, Chicago, to Ceco Steel Products Co., Chicago.

200 tons, bottling plant, Griesedieck Brothers Brewery Co., St. Louis, to Missouri Rolling Mills Co., St. Louis.

175 tons, approach piers, Meeker avenue bridge across Newtown Creek, Brooklyn, to Bethlehem Steel Co., Bethlehem, Pa.; Charles F. Vachris, Inc., Brooklyn, general contractor.

150 tons, platforms and miscellaneous work, Central Railroad of New Jersey, Elizabeth, N. J., to Igoe Bros., Newark; through J. F. Chapman & Sons, Hillside, N. J.

140 tons, bridge, Madison avenue, New York, to Joseph T. Ryerson & Sons Co., Chicago; through Knight & Timoney Co., New York.

140 tons, Ames & Brownley department store, Norfolk, Va., to Truscon Steel Co., Youngstown.

130 tons, Cedarcrest hospital buildings, Newington, Conn., to Scherer Steel Co., Hartford, Conn.; Allyn Wadhams Co., Hartford, general contractors.

125 tons, state teachers college, Indiana, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

125 tons, addition county hospital, Ventura, Calif., to unnamed interest.

120 tons, building addition, Auburn state prison, Auburn, N. Y. to Buffalo Steel Co., Tonawanda, N. Y.

112 tons, assembly building state fair grounds, Sacramento, Calif., to Soule Steel Co., San Francisco.

109 tons, Bitterroot storage dam, Ravalli county, Montana, to unnamed interest.

100 tons, ramp, Tonnelle avenue, Jersey City, N. J., to Joseph T. Ryerson & Sons Co., Chicago; through George M. Brewster & Son Inc., Bogota, N. J.

100 tons, bureau of reclamation, invitation 36,291-A, Homedale, Idaho to Laclede Steel Co.

100 tons, building, St. Joseph college, Adrian, Mich., to Calumet Steel Co., Chicago.

Unstated tonnage, 210,000 square feet, wire mesh, 56-inches wide in 300-foot rolls, U. S. engineer, Omaha, Neb., to Sheffield Steel Corp., Kansas City, Mo., cir. 206, awarded March 3. Ceco Steel Products Co., Omaha, awarded 135,000 square feet, cir. 209, March 8.

Reinforcing Steel Pending

878 tons, Norfolk navy yard requisition, Virginia Steel Co., Richmond, Va., low bidder.

800 tons, tuberculosis hospital, Butler, Pa.

Concrete Bars Compared

	Tons
Week ended March 19	7,949
Week ended March 12	4,288
Week ended March 5	2,640
This week, 1937	4,786
Weekly average, year, 1937	6,266
Weekly average, 1938	5,409
Weekly average, February	5,208
Total to date, 1937	101,365
Total to date, 1938	64,912

Includes awards of 100 tons or more.

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750 tons, mesh, highway projects, Dutchess, Putnam and Nassau counties, New York; bids March 29, department of public works, Albany.

600 tons, Central Nebraska supply canal, Lexington, Nebr.

350 tons, mesh, highway project NSP-38-2, Northern State parkway, sections 2 and 3, Nassau county, New York; Garofano Construction Co., Inc., Mt Vernon, N. Y., general contractor, $515,211.50, bids March 15, Albany.

220 tons, Hylebos state bridge, Tacoma, Wash.; bids at Olympia, April 12.

195 tons, including bars and armored flooring, bridge, Ashland-Bridgewater, N. H.; Lane Construction Corp., Meriden, Conn., low $203,245.36, alternate design A, bids March 9.

135 tons, mostly mat reinforcing, east approach, Connecticut river bridge, sections A and B, Portland, Conn.; A. I. Savin Construction Co., East Hartford, Conn., contractor, $254,015.73, bids March 7.

135 tons, sewer Louisville, Ky.; bids March 29.

115 tons, school, Romulus, N. Y.; bids in.

115 tons, pier substructures, Passaic river bridge, route 25, Lincoln highway, Hudson and Essex counties, New Jersey; bids March 28, Trenton.

105 tons, bridge, Canal street, New York; bids March 23.

Pig Iron

Pig Iron Prices, Page 70

Pittsburgh — Orders still are disappointing. Foundry activity continues slow and increases noted in other sections have not materialized here. Incoming orders are still on a hand-to-mouth basis, and although inventories generally are low, demand has not developed to the point where steady orders are being received.

Cleveland — Pig iron producers note a small increase in current orders, although most consumers continue to specify only for actual requirements. Releases from auto-parts foundries are slow but sellers look for a gradual improvement in buying from this source through the remainder of the month. Farm and road equipment foundries are still comparatively busy but most melters continue on a two and three day weekly schedule. Prices are unchanged.

Chicago — Pig iron shipments continue heavier than a month ago, and a gain of 35 to 40 per cent is indicated for March as a whole. Consumption is slow to increase, but stock depletion by a number of foundries is necessitating the taking of additional tonnages. Some new business is being booked, but only small lots are involved.

Boston—Pig iron buying drags. A few purchases up to 200 tons are being made for shipment through May, but most volume is small lots for prompt delivery. Among the steadiest melters is the district pipe foundry, although some stove foundries have registered mild improvement during the last two weeks.

New York — Pig iron specifications lag, with orders still on a hand-to-mouth basis and showing little improvement in volume. Delivered prices at Brooklyn will be increased only slightly when the new freight rates become effective. Changes will also be made at a number of upstate points, although there will be no change at consuming points in the northern New Jersey metropolitan district where rates on the short hauls involved were advanced last November.

Philadelphia — Little change is noted in the market for pig iron over several weeks, hand-to-mouth buying continuing. Foundry melt is increasing slightly but some foundries are pouring only one or two heats weekly.

Buffalo — Pig iron shipments against contracts are maintained at a fair pace but buyers refuse to place orders beyond immediate needs. Users are continuing to reduce inventories, generally low, and are ordering for fill-in needs. Foundries are working two to three days a week.

Cincinnati — Depleted inventories are indicated by heavier pig iron shipments. With no marked gain in the melt the shipments are all individually small and close to immediate needs, often in the rush class. Contracting for second quarter has been desultory and on a most conservative basis.

St. Louis — A further slight increase in the melt and in shipments is noted. Deliveries so far this month are slightly ahead of the like period in February. Stove foundries have stepped up schedules, and while new orders are not numerous, some stock is being made up for inventory.

Birmingham, Ala. — The pig iron market remains quiet with no change evident from last week, but with a relatively satisfactory demand due, in part, to continued large shipments to Japan. Thirteen furnaces are in blast.

Toronto, Ont. — Pig iron sales are without special feature but are averaging more than 2000 tons weekly. Melters are showing interest and it is said producers will open books for second quarter within the next week. Odd inquiries are reaching the market and local blast furnace representatives look for slightly heavier booking for second quarter. Railroad car and locomotive works have closed good contracts and it is reported Canadian Locomotive Co., Kingston, Ont., has received an order for 15 Pacific-type locomotives costing $2,000,000 from the Canadian Pacific railway, while additional orders for rolling stock are pending from the Temiskaming and Northern Ontario railway, controlled by the Ontario government. Production continues steady with prices unchanged.

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Cold-Finished

Cold Finished Prices, Page 69

Pittsburgh—Principal tonnage orders in cold finished are still coming from agricultural implement builders, with household appliance manufacturers accounting for a fair

proportion. Some small automotive releases are beginning to appear but not in any volume as yet. March tonnages will probably show an increase over February on the basis of a little better first half and anticipated continuation of demand through second half.

Scrap

Scrap Prices, Page 72

Pittsburgh — Most interests are still out of the market in this territory, with last sales at $13.75, down 25 cents from previous quotations. Railroad specialties are somewhat weaker, although most prices remain strictly nominal. Little interest has been shown in recent railroad lists and it is reported a few items were sold from the most recent one, with no tonnages coming into this territory.

Cleveland—Continued quiet marks iron and steel scrap. Shipments consist altogether of occasional carloads but important consumers are not interested at any price. Releases are scarce and infrequent, and then only for fill-in purposes.

Chicago — Scrap continues dull here in absence of active demand from major consumers. Supplies of old material are adequate to accommodate current light requirements of steelworks and foundries, though offerings have shown little change recently. Heavy melting steel nominally continues $12 to $12.50.

Boston — A cargo of 8000 tons of hydraulic compressed scrap leaves Boston and Providence for Europe this week, an incident of note in an otherwise slower export outlook. This material was covered some time ago, $11.50 being paid for most of the tonnage. Meanwhile the more clouded export situation has resulted in another decline in brokers' bids for heavy melting steel grades, $13.25, dock, for No. 1 with No. 2 one dollar less.

New York—With the exception of a few light shipments of foundry grades to district consumers, domestic demand for scrap remains dull, steelmaking grades especially. Most tonnage on order for export has been shipped or covered, dealers paying $12.50 for No. 1 heavy melting steel to fill in some scattered needs. One broker, however, has been paying $13, barge, for this grade. Some tonnage to an Eastern Pennsylvania mill is being shipped at $14.50, delivered, but little of this material is going from this area.

Phladelphia — The scrap market appears to be taking a divergent trend. One leading interest reports sale of a substantial tonnage of No. 1 steel at $14, delivered to a nearby mill, while another reports considerable business to another mill on the basis of $15 for No. 1 and $13.50 for No. 2. The market is at about the same level as the past two or three weeks. This is indicated by the fact exporters find it necessary to pay $14.50 for No. 1 and $13.50 for No. 2.

Buffalo — A small lot of No. 1 heavy melting steel of high quality has been sold at $13 a ton. Although the sale lacked volume it tended to offset talk of paring otherwise nominal price ranges.

Detroit—The few wisps of optimism which floated through the scrap market within the last 10 days following purchase of 2500 tons of borings by a local steelmaker have blown away, and the market generally is weaker by about $1 per ton, except in cast grades, which continue bolstered by fair foundry demand.

Cincinnati — Quotations on iron and steel scrap are lower, with weakness partly attributed to prolonged absence of mill buying. Dealers have lowered bids in resistance to further augmenting of yard stocks, and job lot sales further show the downward trend. Sheet clippings are particularly hard hit by embargoes from customary outlets.

St. Louis—Interest on the part of consumers in iron and steel scrap is almost entirely absent, dealers reporting a minimum of inquiry and only sporadic sales of small lots of special material. One important east side mill which early in the week had out an inquiry for a round tonnage of steel has withdrawn it and has given no intimation as to when the query will be reinstated.

Seattle — The scrap market continues weak and unstable. The Japanese credit situation is unfavorable and prevents sales. Pending shipments will clean up much of the tonnage dealers have carried for months. Local rolling mills are still out of the market, with prolonged shutdowns in prospect.

Toronto, Ont. — Demand for iron and steel scrap is spotty and specialized and local dealers state that comparatively little material is going into yards although offerings have increased over those earlier in the year. Shipment of steel scrap to Hamilton consumers are improving slightly and there is good demand for heavy melting steel, while turnings are moving slowly.

Warehouse

Warehouse Prices, Page 71

New York—Improvement in warehouse buying thus far this month has been less than seasonal. While sales are mildly heavier, there has been no sustained upturn, although demand is well diversified. Price shading is limited.

Cleveland — Sales and shipments out of warehouse have shown little improvement and at least in one instance have fallen behind the com-

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parable period in February. One distributor reports that the number of orders is encouraging but individual tonnages are still low, representing only actual needs. Prices are steady.

Chicago—Sales are larger, business recently being in the best volume for the year to date. This upturn is seasonal but with buying guided primarily by actual needs, expansion in steel consumption is indicated.

Boston — While there has been some improvement in warehouse sales, aggregate volume is low for this period. Specialty lines, including alloys, are making the best showing. Especially is this true in several districts outside of the Boston area. Alloy demand is holding well in the Hartford, Conn., district.

Philadelphia — Jobbers report slightly more active buying, reflecting in part seasonal influence and also release of material against projects previously delayed. This is shown in somewhat better ordering from mills. Progressive improvement over the next three months is expected.

Buffalo — Warehouse sales are holding at the slightly improved level which developed around the start of the month. Some increase in prices on some items may be necessary due to increase in freight rates.

St. Louis — Business is responding to seasonal demands. However, volume is small as contrasted with a year ago, and individual sales are unusually small. General manufacturing trade has not improved and outlet through that source is disappointing. Country machine shops and distributors are carrying large stocks, and are placing only occasional fill-in orders. The betterment in demand for wire and wire products noted recently has been well sustained.

Cincinnati — Warehouse sales are dependent chiefly on general manufacturing trade, building industry buying little. The customary upturn in March has been slight. Prices are firm.

Seattle — Improvement is noted in the jobbing trade, volume being larger than a month ago. More favorable weather and opening of logging camps and sawmills have resulted in increased buying, mostly in small lots. Prices are unchanged but both Portland and Seattle jobbers have agreed upon additional brackets, effective March 21. No other revision is contemplated at this time.

Steel in Europe

Foreign Steel Prices, Page 71

London — (*By Cable*) — Heavy steel is the only active section of the market in Great Britain but seasonal expansion in other branches is expected soon. Traders anticipating restoration of duty on foreign pig iron at the end of March are seeking to speed shipments from Continental ports. It is possible the general decline in demand for steel may be offset by increased requirements for armaments.

Imports of steel and iron products in February were 230,402 tons, compared with 308,735 tons in January, a decrease of 78,333 tons. Exports in February were 156,730 tons, 8042 tons less than in January.

The Continent finds steel output declining and volume of new orders small.

Iron Ore

Iron Ore Prices, Page 72

Cleveland — Receipts of iron ore at lower lake ports for the 1937 season, shipments to interior furnaces, and dock balances on March 1, 1938 follow:

	Receipts	Shipments	Dock Bal. March 1, 1938
Buffalo ..	5,851,276	747,932	110,734
Erie	2,745,295	2,516,672	286,287
Conneaut .	9,635,048	8,996,201	1,917,049
Ashtabula.	6,572,771	5,648,763	1,677,599
Fairport ..	1,904,419	1,830,850	480,218
Cleveland .	10,082,766	7,327,169	766,646
Lorain ...	3,914,834	1,632,816	256,951
Huron ...	967,617	954,932	217,175
Toledo ...	1,923,960	1,171,683	62,435
TOTAL ..	43,597,986	30,827,018	5,775,094
Year ago.	31,431,020	25,074,679	3,337,168

Navy Gets Bids on All-American Ferro

Washington — The navy received bids March 18 for various quantities of ferromanganese at from 3000 to 14,000 tons. Electro Metallurgical Co. bid $104.50 per ton using foreign ore. All other bids were $103, f.o.b. Philadelphia using foreign ores except E. J. Lavino Co., who specified enough ore on hand made from 25 per cent domestic and alternate from 100 per cent domestic ore stocks on hand and to be purchased, at $110.50, Philadelphia.

Colorado Fuel & Iron Co. bid $105, Denver, from 100 per cent domestic ores. The lowest foreign bid, duty paid, was $95, Philadelphia.

Ferroalloys

Ferroalloy Prices, Page 70

New York—A slight improvement in steel production augurs for some increase in the movement of ferromanganese over the remainder of this month. To date, sellers declare there has been little or no change in volume; in fact, daily shipments have shown little variation in more than three months. Prices are holding at $102.50, duty paid, Atlantic and Gulf ports, a level recently reaffirmed for second quarter. A small change in the delivered price at Pittsburgh is expected shortly as a result of the recently announced increase in freight rates. On interstate hauls this increase becomes effective soon; however, until Penn-

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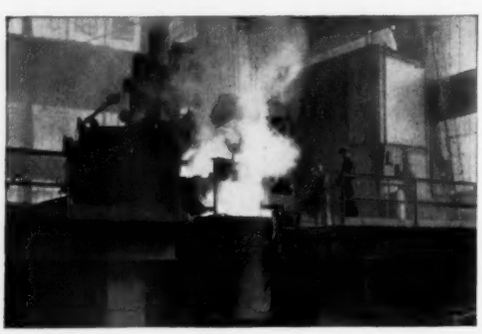

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sylvania takes action with respect to intrastate hauls there will be some question as to the final delivered price at Pittsburgh. Do-

Nonferrous Metals

Nonferrous Metal Prices, Page 70

New York — Political events in Europe proved to be the controlling factor in nonferrous metal markets last week. Sales rate and prices fluctuated with developments in Austria, Spain, and other centers where crises arose. However, a weak closing in Wall street at the week end exerted a depressing influence.

Copper—Export copper displayed strength early in the week but eased on subsequent trading and closed at 9.85c, c.i.f. European ports. Domestic consumers remained cautious although sales exceeded 1000 tons on Thursday. Electrolytic held unchanged at 10.00c, Connecticut. Refined stocks increased 23,890 tons last month but are held in strong hands.

Lead — Buying was spotty with sellers generally balancing intake on only one day, Thursday. Prices were unchanged at 4.50c, New York, and 4.35c, East St. Louis.

Zinc — Prices declined $5 per ton on Monday to the basis of 4.25c, East St. Louis. The cut failed to stimulate business and came as a complete surprise to the trade.

Tin — In view of the unsettled conditions abroad prices held fairly steady. The tone at the weekend was easy with Straits spot quoted 41.12½c.

Antimony — Spot prices held unchanged on the basis of 15.87½c for Chinese and 13.75c for American metal.

Semifinished

Semifinished Prices, Page 69

Incoming orders are somewhat better and the first half of March shows a slight increase over the same period in February. During the past week orders have been improved, as reflected by the increase in ingot production, a substantial part of which is due to semifinished demand. Billets are somewhat more active, with skelp still holding up, although other divisions are running along at about the same pace.

Equipment

Chicago—Sales of machinery and plant equipment show moderate gains in some instances over February. While inquiries are fairly active, hesitancy in closing still is rather general. Little improvement in machine tool purchases by railroad shops is looked for soon. Increase in earnings resulting from the coming advance in freight rates is not regarded as sufficient to cause the carriers to expand purchases of shop equipment materially.

Seattle — Contracts for mining dredging machinery, diesel engines and logging equipment have been placed with various local plants which are having a normal seasonal volume. WPA purchases have increased. Road maintenance machinery and automotive equipment are in good demand. Coulee project contracts have been awardel by the reclamation bureau.

Reader Comments

(*Concluded from Page* 11)

Class 2 fire protected construction. It is claimed that this will permit the construction of apartment houses 100 feet high at less cost than under the old code.

However, apartments come under the multiple dwelling law which is a state law and under this law at the present time every multiple dwelling exceeding six stories or 75 feet in height must be a fireproof building of Class 1 construction. The enabling legislation amending the law is now pending in the state legislature.

Under the new code welding is permitted in accordance with the rules of the board of standards and appeals. These rules have been formulated and adopted after a public hearing Feb. 25. The rules require welding operators to qualify in accordance with recommendations of the American Welding society and the responsibility for design and supervision is placed with the licensed architect or licensed engineer in charge. All shop and field welds are required to be inspected by an inspection agency reporting to the architect or engineer of record and upon the completion of all structural welding operations, the licensed engineer responsible for the design is required to certify to the building superintendent that the fabrication and welding have been carefully inspected and that the requirements of his design and the board of standards and appeals' rules have been fulfilled in every respect. Just how far welding may supersede riveted construction can be determined only by time and experience.

The new code permits a much wider use of field bolting than the old code. In tier structures less than 125 feet high, in which the height is less than two and a half times the minimum horizontal dimension, all column splices and field connections may be bolted. However, connections for supports for running machinery or other moving loads must be riveted or welded. There is no question that in the past we have been unnecessarily extravagant in riveting structures of this type. In apartment houses the cost of riveting the field connections is frequently as high as the actual cost of setting. In the past when cast iron columns were used buildings of this type were completely bolted in the field.

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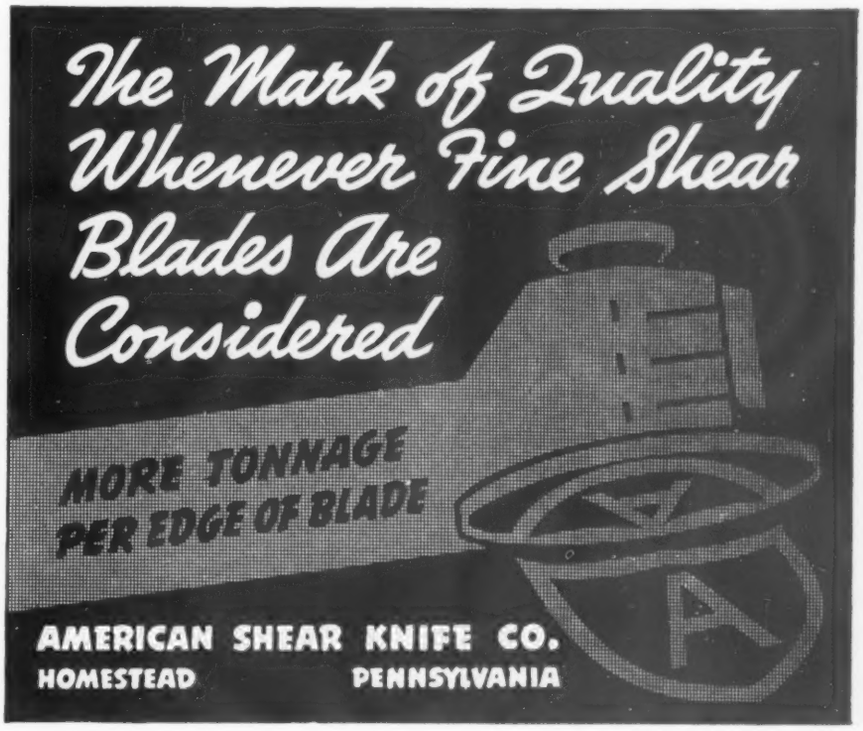
Vice president and
chief engineer,
Post & McCord Inc.,
New York.



Construction and Enterprise

Ohio

ASHLAND, O.—City plans sewage disposal plant. Cost $150,000. Project has been ordered by F. H. Waring, chief engineer, state department of health. Mayor W. A. Mason plans to submit issue to city council at once, urging bond issue to finance constructing the project. E. M. Ken, Ashland, engineer.

BOWERSTON, O. — Village plans municipal waterworks system, including reservoir, well and distributing lines. Cost over $15,000. H. L. Beavis, 13012 Beachwood avenue, Cleveland, engineer.

CLEVELAND—Ernest McGeorge, architect, 9400 Quincy avenue, is taking bids for two-story factory addition at 3734 East Seventy-eighth street for Cleveland Pneumatic Tool Co. A. F. Bamer, secretary. Cost $75,000.

CLEVES, O. — City held an election March 15 to vote $950,000 bonds for constructing sewage disposal plant and sewerage system. F. Pontius, in charge of preliminary plans.

COLDWATER, O.—Village plans iron removal and water softening plant. Cost over $15,000. Champe, Finkebeiner & Associates, Nicholas building, Toledo, engineers.

COLUMBUS, O.—Commercial Welding Co., 4427 North Park street, was recently damaged by fire.

HARRISVILLE, O.—Village plans constructing waterworks. Cost $80,000. R. E. Roush, mayor, in charge of plans.

NEWARK, O.—City has appropriated funds from water department for purchasing new pumps. Cost $25,000. F. Simross, director public service.

RAVENNA, O.—Ohio Bell Telephone Co., Ravenna, plans construction program for Kent and Ravenna, including establishing dial system, new building and equipment, relocation of cables, and constructing long distance cable between Kent and Ravenna. Cost $383,000.

STEUBENVILLE, O. — Standard Slag Co. plant of the Wheeling Steel Corp. was recently damaged by fire, including machinery.

TOLEDO, O.—R. S. Wenzlau, director of schools, receives bids to March 24 for transformers, circuit breakers, etc., for vocational high school, Toledo.

WADSWORTH, O.—Municipality plans waterworks. Cost $40,000. Barstow & LeFeber, 31 North Summit street, Akron, engineers.

WEST UNION, O.—Town is planning complete waterworks system for town and nearby territory. Bonds totaling $46,000 available. WPA will furnish $105,671.

WRIGHT FIELD, DAYTON, O.—War department, air corps, receives bids to 10 a.m., March 23, for six portable two-stage air compressors, delivery March Field, Calif.; until 10 a.m., March 25, for two bench-type grinders and six pedestal-type grinders, delivery f.o.b. contractor's plant; until 10 a.m., March 29, for 12 steel-core, copper-covered ground rods, 12 ground wire clamps, and two 15 to 5-ampere current transformers, delivery Wright Field.

Illinois

BELLEVILLE, ILL.—City will hold election April 12 to vote $582,000 in bonds for constructing sewage disposal plant with auxiliary equipment and sewerage system to relieve congestion in western and southern sections of the city. J. G. Cooney, 3303 Rowland street, Belleville, and Consoer, Townsend & Quinlan, 205 West Wacker drive, Chicago, engineers.

JOLIET, ILL.—City plans installing valves and repairing distribution system. Cost $14,000. Approved by city council. R. Bamon, city hall, engineer.

PLAINFIELD, ILL. — Town voted bonds for constructing sewage treatment plant. Cost $50,000.

Indiana

Corporation, care of Holmes & Douglas, 240 Fifth avenue, New York, (R. Joseph in charge) plans metal manufacturing plant in Indiana. Negotiations for site now in progress. Cost $600,000.

CORYDON, IND.—Town board is preparing plans for sewage disposal plant and sewerage system. Cost $100,000. R. C. Lennox & J. C. Matthews, 833 Architects and Builders building, Indianapolis, engineers.

LINTON, IND.—Board of public works, E. V. Bull, chairman, soon takes bids for sewage disposal plant including mechanical screen, one 300-gallon per-minute and one 500-gallon-per-minute vertical pedestal-mounted sewage pump, float switch, pump control assembly and other equipment. Cost $100,000. WPA project. L. Finch, 276 Century building, Indianapolis, engineer. (Noted in Steel, Dec. 27, 1937).

NEWCASTLE, IND.—Newcastle Machine, Welding & Engineering Corp. has been incorporated here at 246 South Twenty-third street. Resident agent, Frank D. Brebner, same address. Frank Brebner, Ora Morris, Sam M. Denton, incorporators.

New York

BROOKLYN, N. Y.—Cudahy Packing Co., Thirty-third and O Streets, Omaha, Nebr., plans altering two-story plant at 15 Prince street. Cost with equipment, $40,000. Boars Head Provision Co., 1202 Metz avenue, lessee.

BUFFALO—Buffalo airport will start building and improvement program in near future. Includes administration building and new hangars. Cost $750,000.

LAKE GEORGE, N. Y.—Village plans sewers and sewage pumping station. Cost exceeds $25,000. Plans approved by division of sanitation, New York state department of health. Engineer, care of owner, engineer. Maturity soon.

NEW YORK—McCabe & Sheeran Machinery Corp., 50 Church street, New York, is dismantling and selling the plant and equipment of the Penn Bridge Co., Beaver Falls, Pa. Includes punches and shears, bending and straightening rolls, cranes, planers, machine shop equipment, motor generator and other equipment, pattern shop equipment, hoists, motors and miscellaneous tools.

NEW YORK—Brooklyn Can Corp., has been incorporated here with 200 shares no par value stock by Ralph A. Santoro, 277 Broadway.

NEW YORK—Consolidated Edison Co. has taken out permit for alterations and improvements to seven-story steam electric generating plant at 320-26 West 201st street. Cost about $250,000. T. R. Galloway, company engineer, in charge.

ODESSA, N. Y.—Water board soon takes bids for water supply system. Cost $70,000. William T. Field Engineers Inc., Flower building, Watertown, engineer.

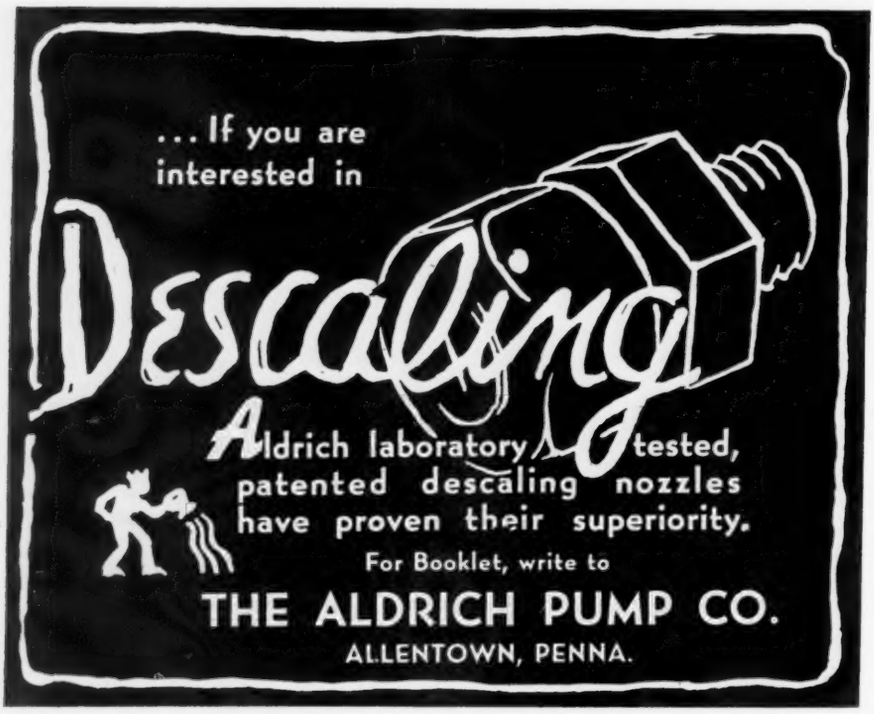
OSWEGO, N. Y.—Central New York Power Corp. Electric building, Buffalo, and 15 Broad street, New York, plans steam generating plant, maturity in summer. Cost $9,500,000. N. Gibson, care of owner, engineer. H. M. Cushing, care of owner, Buffalo, chief mechanical engineer.

OSWEGO, N. Y.—New York, Ontario & Western Railroad Co., W. C. Heidenthal, chief engineer, Middletown; New York Central railroad, J. W. Pfau, chief engineer, 466, Lexington avenue, New York; and Delaware Lackawanna & Western Railroad Co., G. A. Phillips, chief engineer, Hoboken, N. J., plan joint development of East Cove property of New York, Ontario & Western Railroad Co., including modern coal-handling plant, warehouse, cranes and other equipment.

WARSAW, N. Y.—Village held special election March 15 to approve constructing filtration plant at Rock Glen four miles from here and bond issue to finance same. Cost $54,000. S. E. Preble, care of Industrial Planning Corp., Delaware avenue, Buffalo, engineer.

District of Columbia

WASHINGTON—Treasury department,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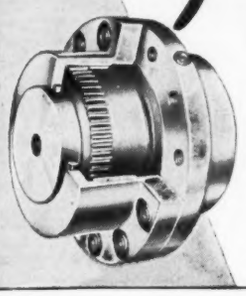

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procurement division, public buildings branch, plans installing motors and controls, transformers and accessories, electric hoists, conveyors and other equipment in new addition to local government printing office. Cost about $2,000,000. Appropriation being arranged effective with federal fiscal year beginning July 1, 1938.

WASHINGTON—Navy department, bureau of supplies and accounts, receives bids to 10 a.m., March 22, schedule 3021, for 5900 feet seamless steel tubing, delivery Baldwin, Long Island, N. Y.; until 10 a.m., March 25, schedule 3017, for slip roll forming machine and hand brake, delivery San Diego, Calif.; schedule 3018, for motor-driven bench lathe, delivery San Diego, Calif.; schedule 3081, for nickel-copper alloy forgings, delivery Washington, D. C.; schedule 3051, for motor-driven milling and tapping machine, delivery Philadelphia; schedule 3058, for corrosion-resisting sheet steel, delivery White Plains, Md.; schedule 3060, for pipe-threading, motor-driven machine, delivery Boston; until 10 a.m., April 1, schedule 3049, for electric crane truck with lead battery, delivery various east or west coast points.

Maryland

BALTIMORE — Krause Bottling Co. has plans in progress for bottling plant, at 415-17 North Paca street.

Kentucky

FRANKFORT, KY.—Old Kennebee Distilling Corp. plans rebuilding burned portion of distillery.

FRANKFORT, KY.—U. S. housing authority has tentatively allocated $500,000 for low-cost housing project here.

LAWRENCEBURG, KY. — Anderson County Rural Electric Co-operative has $197,000 available for constructing lines, extending lines in northern Mercer and Washington counties, and a portion of Southern Franklin county.

LOUISVILLE, KY.—Louisville board of education is contemplating enlarging Theodore Ahrens trade school, supplementing a $200,000 fund with a PWA application for $165,000.

MAYFIELD, KY.—Ed C. Ray, George Rogers and associates have formed electric co-operative association to construct rural distribution line 170 miles long to serve 850 customers in South Graves county. Ray C. Hanaberry, Louisville, engineer. Farland Robbins, Mayfield, attorney.

OWENSBORO, KY.—Otis & Lea, Louisville, architects, are making plans for six-story hospital to be erected by city commissioners of Owensboro and the Davies county fiscal court. Cost $200,000.

SHELBYVILLE, KY.—City has estimates prepared by engineers for constructing sewage disposal plant. James J. Hackworth, Joe Wakefield, committee.

Florida

MIAMI, FLA.—Crystal Springs Water Co., C. F. Kittel, 92 Northeast Twenty-eighth street, is receiving bids for warehouse and bottling plant.

TALLAHASSEE, FLA. — Tallahassee Coca Cola Bottling Co. receives bids March 25 for constructing two-story bottling plant. Francis P. Smith, Norris building, architect.

Mississippi

LAUREL, MISS. — Masonite Corp., W. H. Mason, vice president, plans new chemical plant to salvage materials now wasted. Among the products will be furfural and alcohol. B. O. Stewart, assistant director of research at the plant.

WOODVILLE, MISS.—Town, Mary B. Scott, clerk, receives bids April 5 for furnishing 12¾-inch standard water meters and one 125-gallon-per-minute direct-connected centrifugal pump with 25-foot head and three-phase motor.

South Carolina

SPRINGFIELD, S. C.—D. T. Duncan, engineer, Greenwood, has made preliminary survey for proposed hydroelectric plant in western end of Orangeburg county about 1½ miles from Springfield. Bill to construct plant passed by house of representatives. L. W. Busbee, Columbia, S. C., is interested.

Tennessee

GATLINBURG, via SEVIERVILLE, TENN. — Public utilities commission, Chattanooga, granted permit to Wallace Brooks, president, Brooks Equipment & Mfg. Co., 1840 Terrace avenue, Knoxville, to construct waterworks system and sewerage system. Cost $123,000.

JACKSON, TENN.—City, A. B. Foust, mayor, receives bids about April 5 for furnishing and installing a 4-kilovolt loop line, 13-kilovolt feeder lines, unit type substations and switchgear, known as subproject A, contracts No. 1 and No. 2. Freeland Roberts & Co., 1208 Third National Bank building, Nashville, engineer. Contract No. 1 switchgear and unit built, substation; contract No. 2, distribution system, erect substation. Estimated cost $135,000. (Noted in STEEL, Feb. 28, 1938)

MURFREESBORO, TENN. — Middle Tennessee Electric Membership Corp. was granted an additional loan of $74,000 by REA for a 46-mile line extension to rural system. L. P. McFarland, Lebanon, attorney.

Virginia

NORTON, VA.—Town, Roy P. Bishop, town manager, may vote on $150,000 bonds for power plant and distribution system.

Arkansas

BERRYVILLE, ARK.—Carroll County Electric Co-operative Corp. was granted authority by state utilities commission, Little Rock, to construct 139 miles rural electrification lines. Cost $200,000.

FULTON, ARK.—Brooks Shults is interested in establishing carbon black plant in Miller county.

PARAGOULD, ARK.—City, A. H. Massengill, mayor, receives bids April 14 for furnishing tools, equipment, labor and materials and constructing complete electric light and power plant and distribution system. W. A. Fuller Co., 2916 Shenandoah avenue, St. Louis, Mo., engineer.

Oklahoma

DURANT, OKLA.—City votes April 5 on $30,000 bonds for purchasing new equipment at city water pump station and for purchasing and installing water mains.

WEATHERFORD, OKLA. — City has preliminary plans for installing water softening equipment in water plant. Cost $20,000. W. C. Hart, mayor. Engineer not yet appointed.

Wisconsin

FOND DU LAC, WIS.—Giddings & Lewis Machine Tool Co., manufacturer of heavy-duty equipment for boring, milling and drilling, has let general contract for constructing shop addition.

MILWAUKEE — Wisconsin Telephone Co., 712 North Broadway, has filed application with public service commission of Wisconsin for permission to invest $4,100,000 in plant construction and expansion during 1938. George F. Crowell, chief engineer.

Minnesota

EVELETH, MINN.—City, D. Jerome, city clerk, will hold a special election soon to vote on constructing municipal light and power plant to cost $850,000. PWA fund of $260,000 assured. Hugo Sholund, city engineer.

MADISON, MINN. — City, James H.

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PLANTS

Philadelphia, Pa. Cicero, Ill.

Hayden, city clerk, is contemplating purchasing additional power plant equipment, generator and water softener. To be financed by bond issue. Perkins & McWayne, 322 Paulton block, Sioux Falls, S. Dak., consulting engineers.

WESTBROOK, MINN.—Village, T. V. Peterson, clerk, is completing plans and will receive bids about April 10 for constructing diesel light and power plant and distribution system. Cost about $78,000. Buell & Winter Engineering Co., Insurance Exchange building, Sioux City, Iowa, consulting engineer.

Texas

ATLANTA, TEX.—City, E. C. McKinney, secretary, F. J. Von Zuben, engineer, Electric building, Ft. Worth, will have plans complete about March 21 for extensions and improvements to waterworks, including new 125,000-gallon elevated tank, complete sewer system, and sewage disposal plant. Bonds totaling $90,000 available.

DALLAS, TEX.—Southwestern Bell Telephone & Telegraph Co. plans expending $2,250,000 in 1938. Improvement program will include $540,000 for additional equipment in central exchange, completion of $250,000 Haskell exchange addition, and major outside plant extensions into Kessler Park, Fruitdale, Trinity Heights, Lemmon avenue etc.

EDCOUCH, TEX.—City soon takes bids for installing necessary units to complete unified water system, including mains, pumping equipment and pressure tank. Cost $35,000. H. H. Kidder, San Juan, engineer.

FREER, TEX.—City, J. M. Momey, mayor, plans constructing water distribution lines, pumping unit, tank and tower. Cost $60,000. Maturity in spring. Garrett Engineering Co., 308 Hughes street, Houston, engineer.

GROVES, TEX.—City is having preliminary plans prepared by M. D. Gates, Port Arthur, consulting engineer, for water purification plant and sewage disposal system. Cost $195,000. Will create water district.

WICHITA FALLS, TEX.—Phillips Petroleum Co., Bartlesville, Okla., plans natural gasoline plant here. Cost $500,000. A. H. Riney, Bartlesville, Okla., engineer.

Kansas

KANSAS CITY, KANS.—Board of city commissioners plans installing motors and controls, regulators, transformers and accessories, switchgear, electric hoists, electric cranes, conveyors and other equipment in new bulk food terminal on Kaw river, public levee district. Includes 5 one and multi-story buildings, one with electric refrigeration plant. Cost $4,250,000. Financing arranged through federal aid. Alonzo H. Gentry, Voskamp & Neville Inc., 4 West Thirteenth street, Kansas City, Mo., architects. Joseph W. Radotinsky, Commercial National Bank building, Kansas City, Kans., associate architect.

South Dakota

DELL RAPIDS, S. DAK.—A $10,000 bond issue carried at special election March 1 to finance city's share of cost of constructing sewage disposal plant. Cost $30,000. Application will be made for aid to WPA. G. R. Neher, city auditor, Buell & Winter Engineering Co., Insurance Exchange building, Sioux City, Iowa, consulting engineer.

FLANDREAU, S. DAK.—City, Carl Hanson, city auditor, has purchased present light plant and is awaiting approval of application for PWA grant to finance purchasing two additional diesel engines, 350 horsepower each. Buell & Winter Engineering Co., Insurance Exchange building, Sioux City, Iowa, consulting engineer.

Iowa

AVOCA, IOWA—City, Charles P. Blust, mayor, is taking bids to 9 a. m., April 2, for constructing water treatment plant with necessary equipment. Currie Engineering Co., Webster City, Iowa, consulting engineer.

DES MOINES, IOWA—City water board of trustees is considering constructing water softening plant as WPA project. Cost about $750,000.

HAMBURG, IOWA—City, E. L. Lair, city clerk, is taking bids to 2 p. m., April 4, for constructing water treatment plant with aeration, chemical softening and filtration building and piping. Currie Engineering Co., Webster City, Iowa, consulting engineer.

WATERLOO, IOWA—City, K. C. Mathews, city clerk, will start work soon on constructing sewer, including reinforced concrete pipe, manholes, two control houses, pumps and motors. Cost $370,000. C. K. Wilson, city engineer.

Idaho

LEWISTON, IDAHO—Bids for the third unit of power line project of Clearwater Valley Light & Power Co. will be received March 25 by T. C. Smith, chief engineer. Contract involves 150 miles line in Latah and Benewah counties, Idaho, and Whitman county, Washington.

New Mexico

SANTA FE, N. MEX.—City, care of H. B. Lotz, city engineer, plans election to vote $75,000 bond issue to be used for scrapping sewage disposal plants now in use. Will locate large disposal plant on river beyond village of Agua Fria, and will build new outfall line from present gathering system to new plant. Cost $300,000. WPA project.

Pacific Coast

LOS ANGELES—Schumacher Wallboard Co., Los Angeles, is considering erecting a plant on gypsum property in the Boulder dam vicinity, Nevada.

ST. HELENS, OREG.—George H. Buckler Co., Portland, has general contract for major improvements at plant of St. Helens Pulp & Paper Co.

ASOTIN, WASH.—WPA funds totaling $53,450 have been made available for proposed city water system.

HOQUIAM, WASH.—Reece Woods has applied for franchise from Taholah Indian agency for constructing electric power plant. Contract is being prepared.

QUINAULT, WASH.—Quinault Power Co. plans transmission lines in Quinault valley area, including power substations and switching stations. Line will connect with new hydroelectric generating station, one of six to be built in vicinity of Ewell's falls on Ziegler Creek. John Cunningham and F. S. Ziedhack, Portland, Oreg. consulting engineers.

SEATTLE—Bids for proposed hospital to be built at Anchorage, Alaska, for the Sisters of Charity, House of Providence, will be opened April 6 by Sister Mary Mildred, Mt. St. Vincent, West Seattle. Plans by John W. Maloney, Yakima, Wash. Cost $275,000.

NOME, ALASKA—Fire recently damaged machine shops and garage of the U. S. Smelting & Refining Co. here.

Canada

FREDERICTON, N. B. — Upsalquitch Water & Power Co. Ltd., care of P. J. Hughes, 366 Queen street, plans developing hydroelectric power on Restigouche river. Cost $1,000,000. Application has been made to the government for permission to construct the plant.

SYDNEY, N. S.—W. H. Norris, president, Sydney Curling club, takes bids sometime in spring for ice-making machinery for installation in curling rink. Cost $30,000.

HAWKESBURY, ONT.—Canadian National Paper Co. Ltd., is preparing plans for an experimental settling and water filtration plant. Estimated cost $20,000. Gore & Storrie, 1130 Bay street, Toronto, engineers.

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